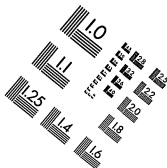
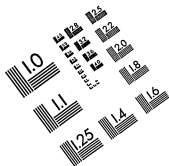


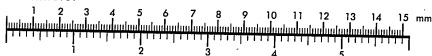


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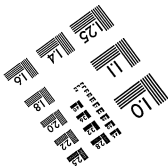
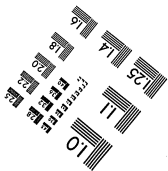
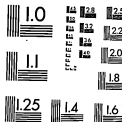
MS303-1980



Centimeter



Inches



Thomas A Edison Papers

A SELECTIVE MICROFILM EDITION

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6

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The pages which were microfilmed for this collection are in generally good condition in the original. There are some pages, however, which due to age are lighter than normal. Additionally, because some volumes are very large and have been bound tightly and cannot be unbound, there are intermittent occurrences of slight distortion of the edges of a small percentage of the pages. We have made every technical effort to ensure complete legibility of each and every page.

Laboratory Notebook, Cat. 1176

This notebook contains only a few dated entries, covering the period April 1873-November 1874. It is entirely by Edison and relates to telegraphy. Pages 1-55 contain notes and drawings of Edison's and other inventors' telegraph devices. They may have been intended for use as illustrations to accompany Edison's essays on telegraphy and electricity (see NS-74-002, Unbound Notes and Drawings). There is one dated entry (page 59) for April 17, 1873. Pages 57-63 contain notes and drawings on duplex telegraphy dated September 10-12 and November 2, 1874. Pages 64-66 contain Edison's drawings and notes on what Ezra T. Gilliland remembered, probably in 1875, about H. Nicholson's work on multiple telegraphy during the early 1870s. The book contains 320 numbered pages.

Blank pages not filmed: 67-320.

Duplex.

Repeater

Fac Simile

Dot & Dash Chemical "Auto"

Magnetic Auto

Telegraph Inductive & discharge Currents.

Printing Instruments,

Transmitters for do,

Perforating Machines.

Relays

Sounder.

Morse Recording insts.

Movements,

Application of Magnetism

" " Electricity

Mechanical Electric Movements

Magnetic Telegraphy

Induction Coil Telegraphy

Contracts

Batteries,

Novel Connections,

Manipulations novel,

Electromagnetic Engines

Duplex. Strauss - get copies Patents =

" Farmer " " " Extension & Release,
" Siemens & Halske - Kramer, get copy telegraph giving
description =

Edisons as shown in telegraph
Mention former Blackwork Double Trans
" Edisons Magnetical do same principle
& recent Barton Experiments

Have Double Transmittal Article in
Dub, Schellen & Blavier DuMonast
Translated =

Edisons No 1 as in telegraph

Edisons No 2 Vibratory

Edisons No 3 Mechanical Equalizer.

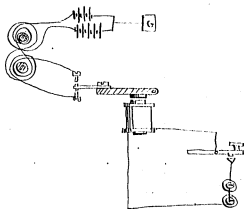
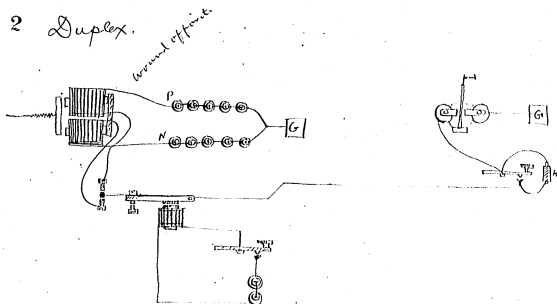
" No 4 Shunt with Rev banding
on single relay

Reverse Current one & increase & decrease
other =

Double Trans (Reinforced
Wheeler in connection)

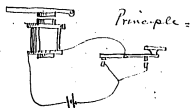
Condenser Application by Strauss
and other means such as a Condenser
of a double coil. No Condenser but
Extra Coil or relay to take induction
also to Shunt Duplex relay with
wider Resistance =

2 Duplex.

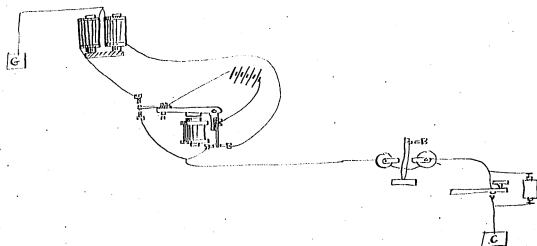
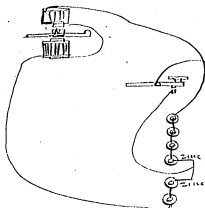


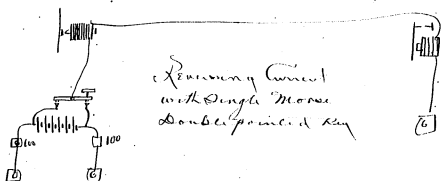
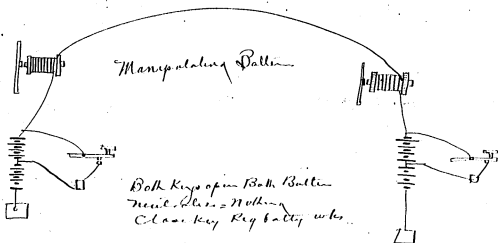
Now you cannot
sense a circuit through
an electric element
without opening it.

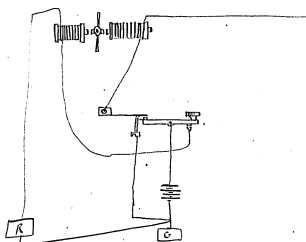
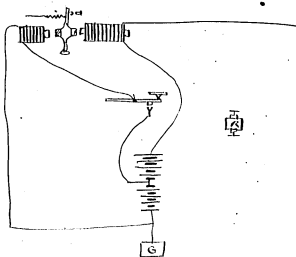
yes but you can
make let it open
if you for you
consider me
for Amad



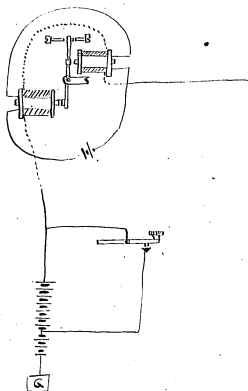
Reversing a Battery without mechanical mechanism
a Morse key in a Circuit





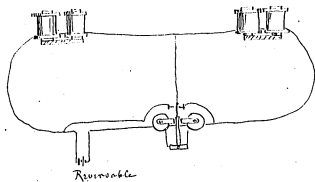
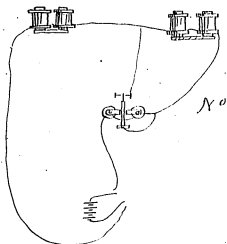


6

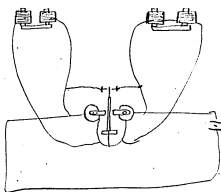
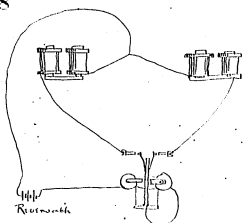


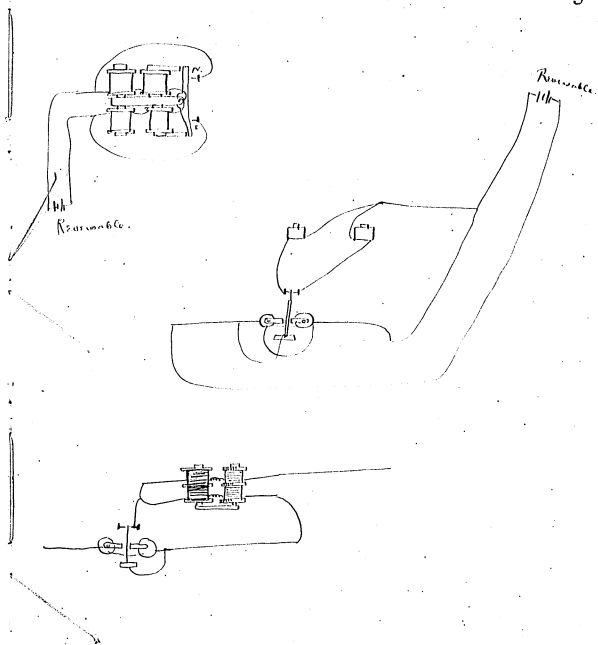
Polarized Switches

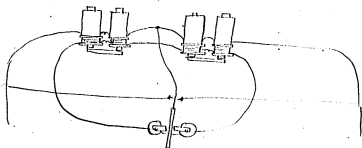
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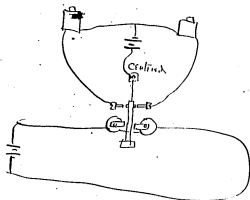
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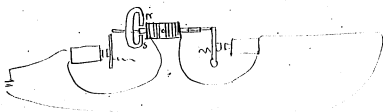
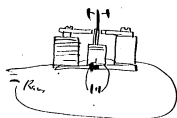
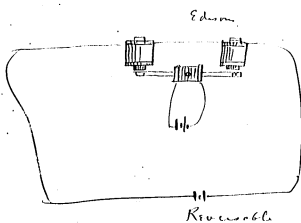
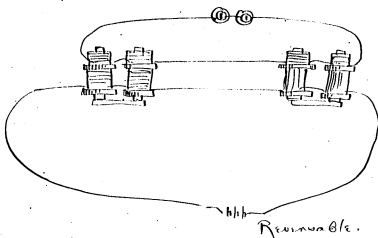


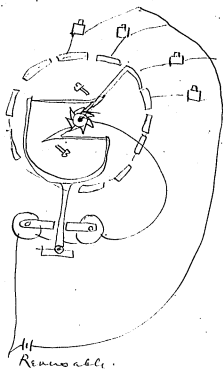




Polarized Relay worked by induction from Extra Coils
 The direction of the current generating right induction
 to select,



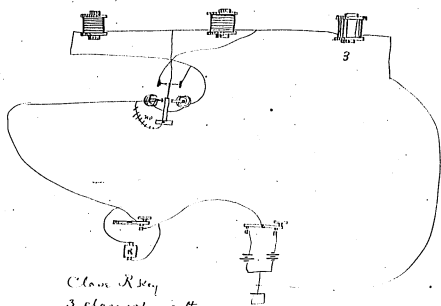




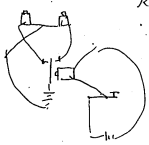
Renovable

3 motion one wire.

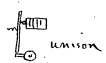
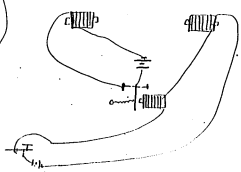
13



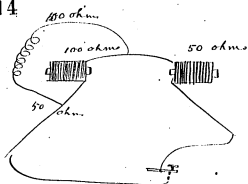
Close Key
3 close when either
Res Battery on



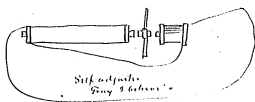
Siden



14

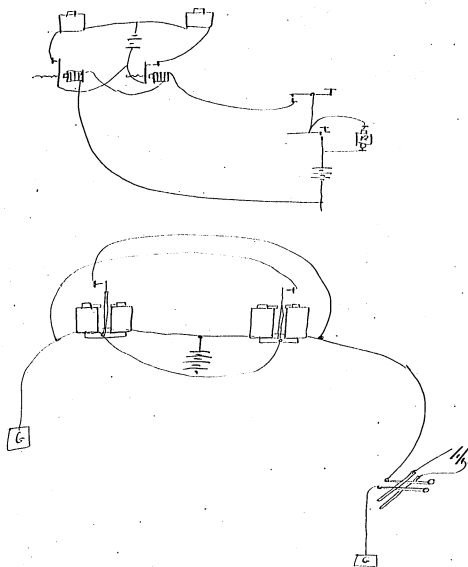


Equalizing unequal magnet.

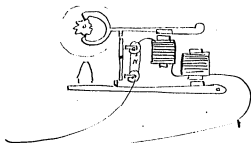
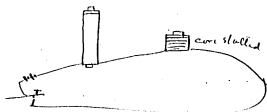


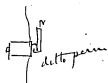
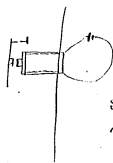
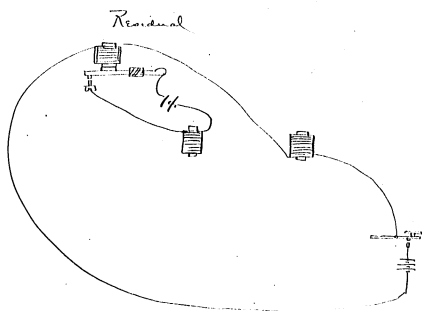
Duploy & Roberts self actuating.

get out of Duranti self actuating



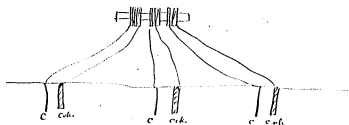
Brasotube over core



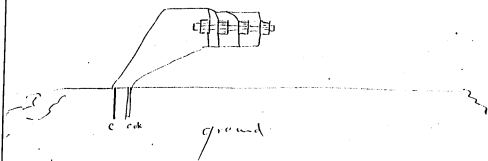


"op"
slight current to make magnet
discharge quick

Explain about Small Type wheels
advantages over large wheels used
before they were introduced



From 3 Battery mode of intensifying

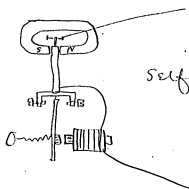
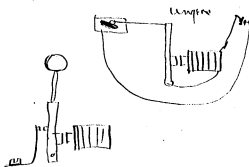
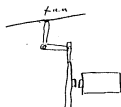
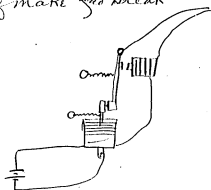


getting intensity by means of magnets

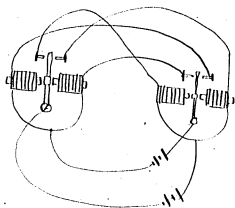


Relay with no armature

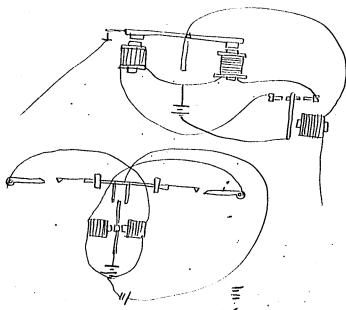
Self make and break



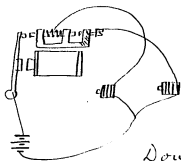
Self make and break



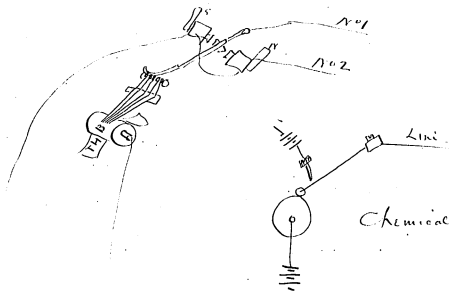
Self actor. slow & steady

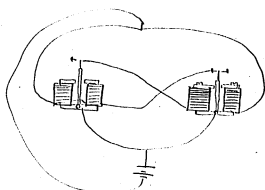


McCracken's alternating Battery -
Edison's Ink Recorder -

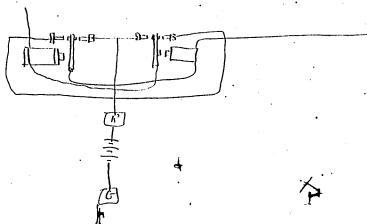


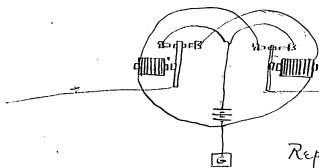
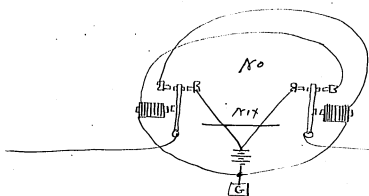
Double magnet one class first
or weak current one strong elect
work both -



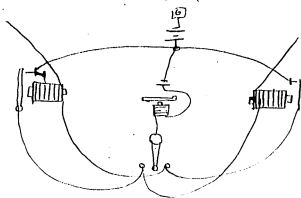


Movement

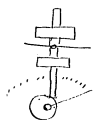
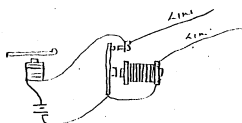




Repeater used on Europe
Line

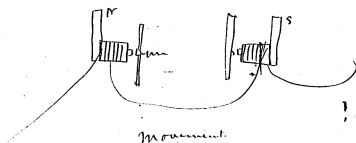


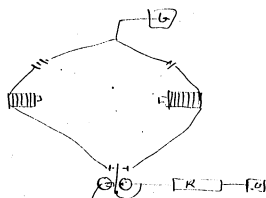
Edison Button Repeater



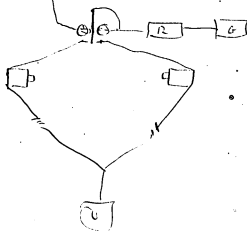
Regular Motion

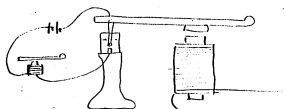
Mention Stenkinge au magnet



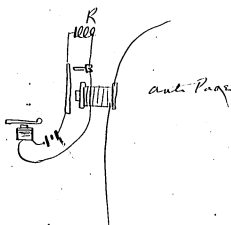
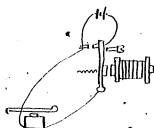
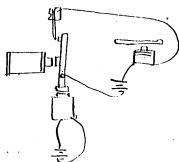


Double Vibrating Frame

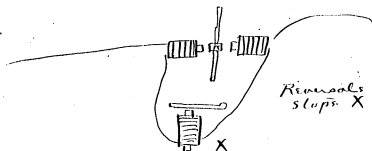
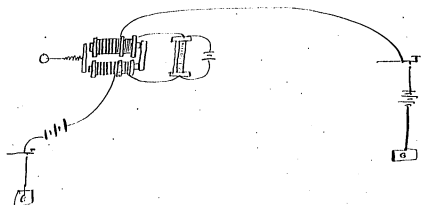


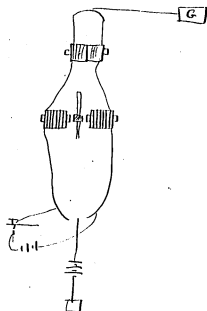


anti Page



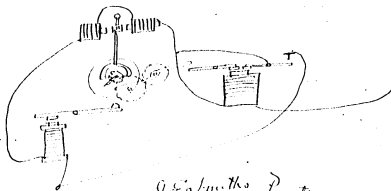
anti Page







Wesmans Magnet applied to Gallaghers Printer.



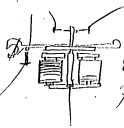
G. & A. m. the Printer.



Magnet of flat spiral



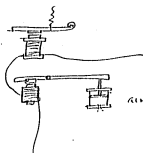
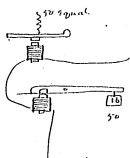
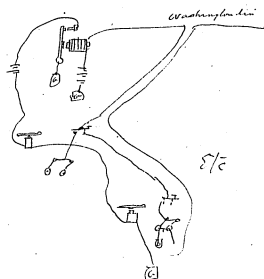
Labels all magnet.

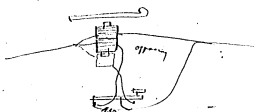
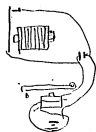


Edwin Danks
Johann
& Electro.

Don't come in
so much to me
1/2 bar just as well.

Just said that smooth
wire same size weight etc.
harder to use than rough.





Repeating

Hix No 1.2.

Miliken

Farmer

Pope's Book

several

Edison at Ind. & Mass.

Bunnell.

Gray & Barton.

Clark

Vandey

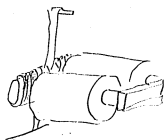
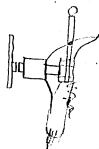
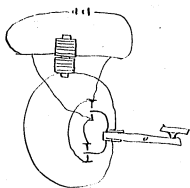
European

Faces.

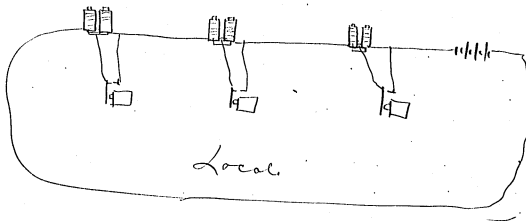
Haskins

& all Edison can get

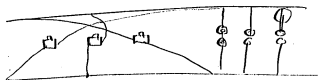
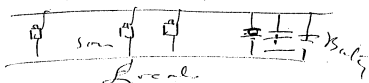
32



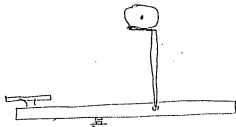
No iron



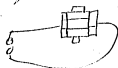
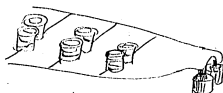
Local



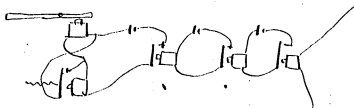
The best form self closing key probably
 attached small device which would
 keep points away when key operated
 but close in few seconds

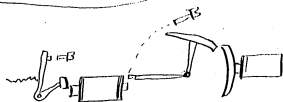
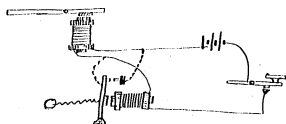


34

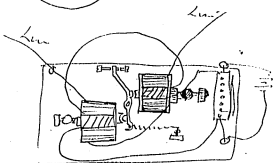
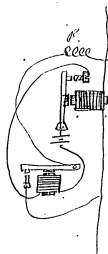
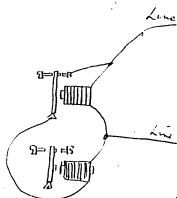
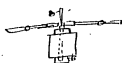
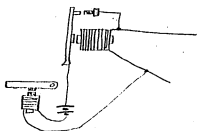


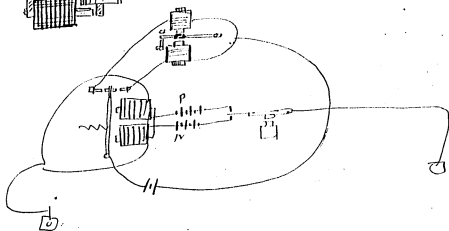
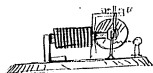
110

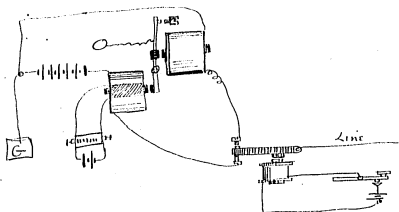
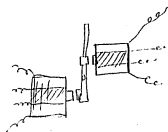


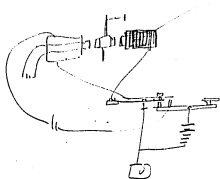
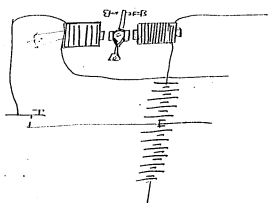


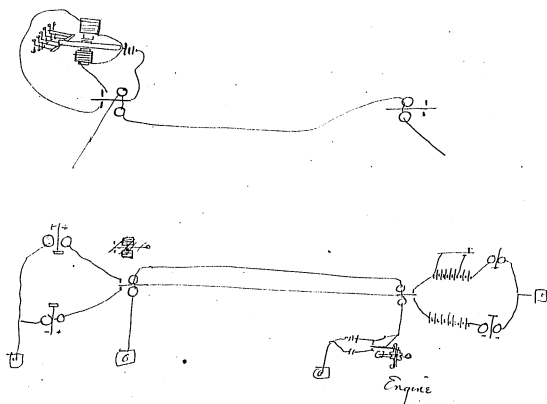
Tremendous Battery decompose water on
 insulator in the line ok ~

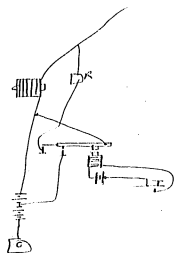




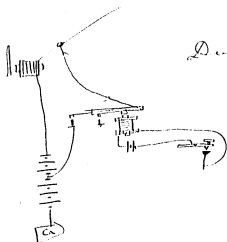




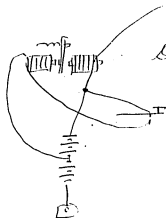




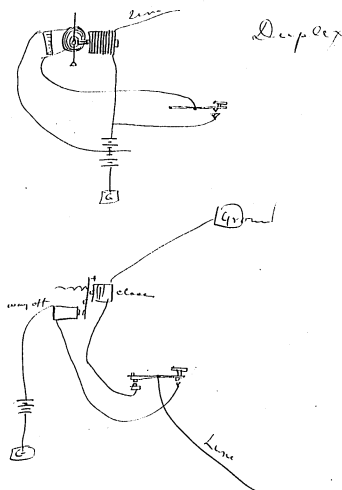
Duplex

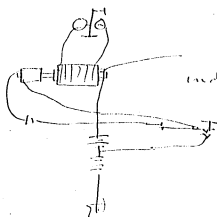


Duplex

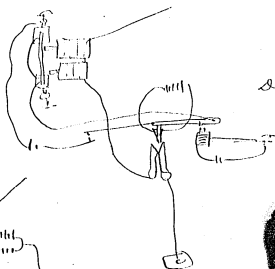


Duplex

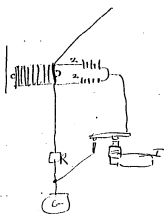




induction Duplex

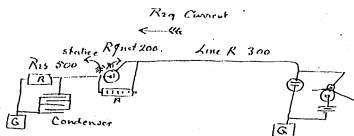


Duplex.



Duplex

Edison's system of Cables, working by
Centres of resistances and static accumulation

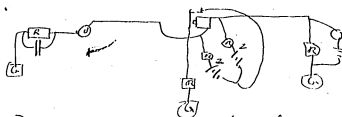
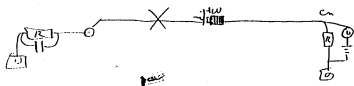
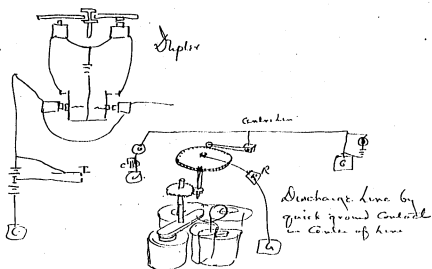


This system gives perfect work between New York
and Washington at 1600 words per minute.

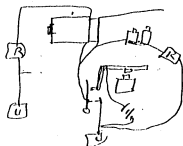
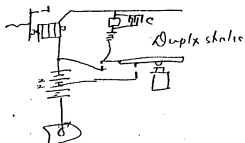
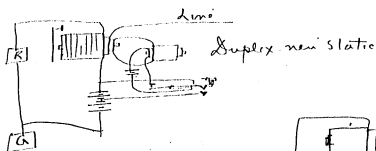
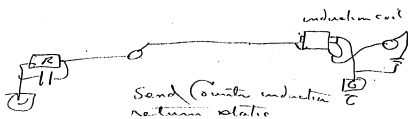
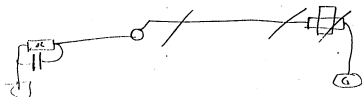
Experiments to be tried to lessen
The resistance of the artificial line —

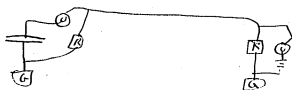
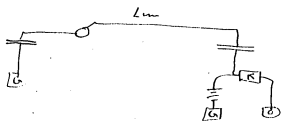
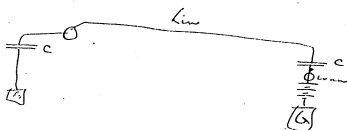


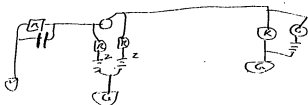
still later 3180 words per minute readable =

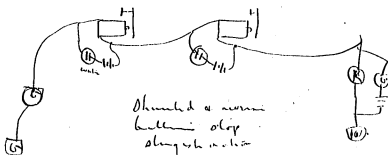
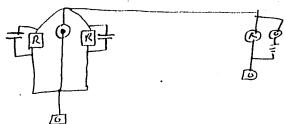


Repeat in them helgh to get morse signal
through and throwing line direct when
out.





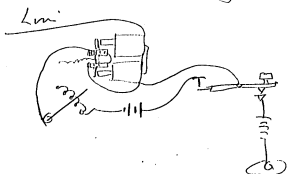
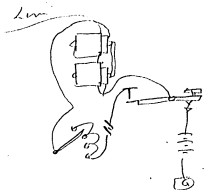
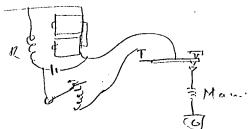
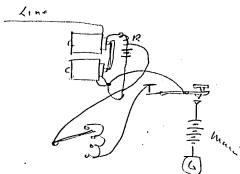
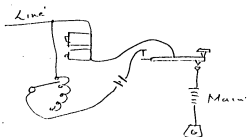


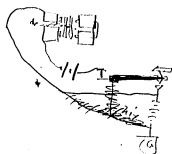
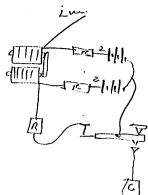
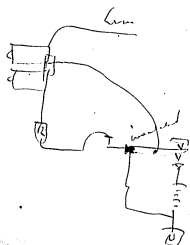
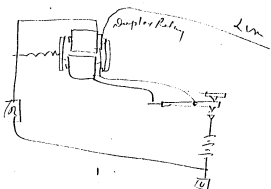
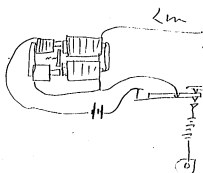


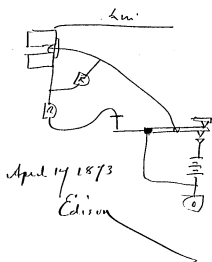
Should a series
battery only
slightly in series

Escape compensated Relay

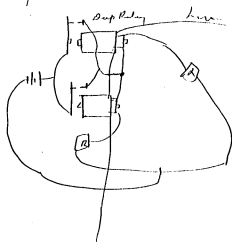
No 1





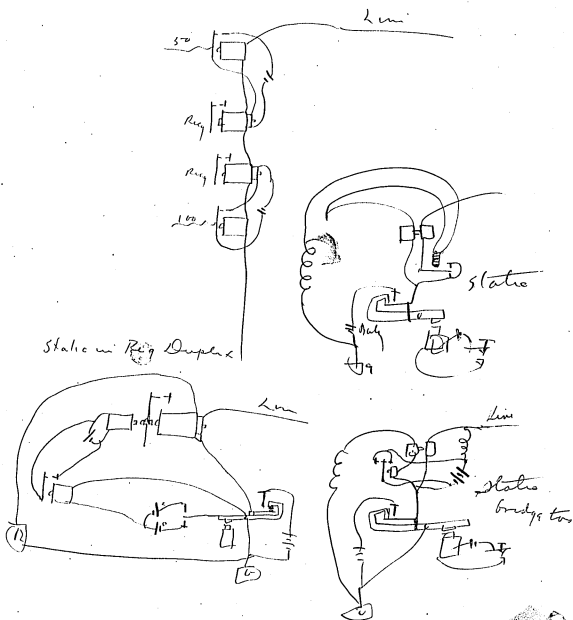


Duplex Same direction



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55

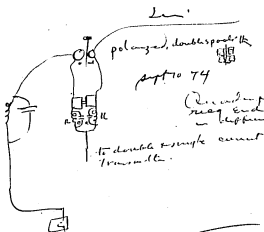
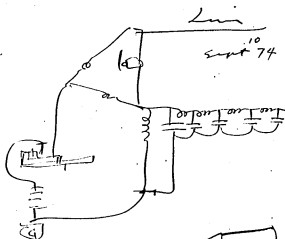
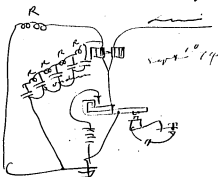


[LEFT PAGE IS BLANK]

Entered Sept 10, 74

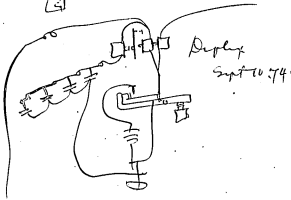
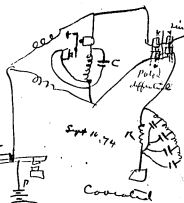
57

Best arrangement for static



Condenser at mag end shown arranged in bifurcated

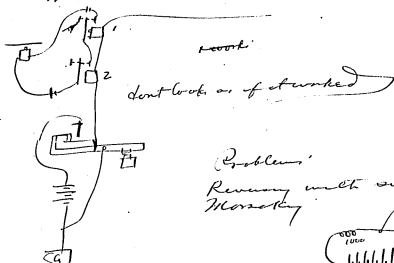
to double sample current transmit



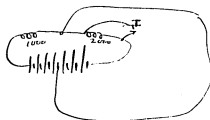
58

Sept 10. 74.

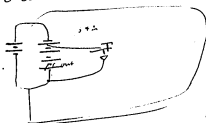
~~Transducer~~ Duplex which is neither differential or bridge.



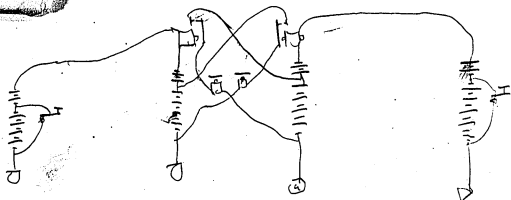
Problems:
Reversing with single battery
Horseplay



also.

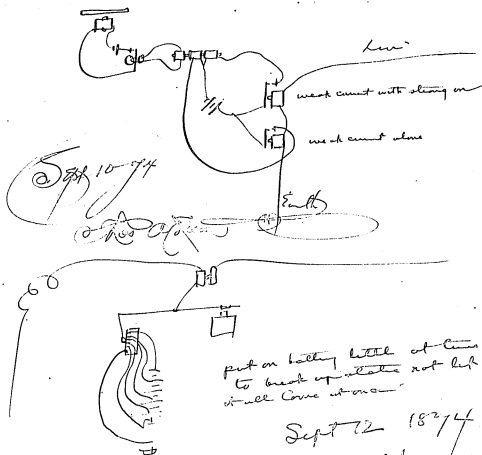


Repair

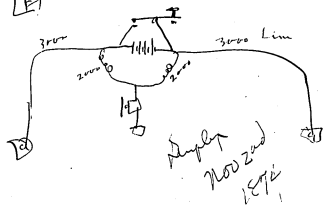
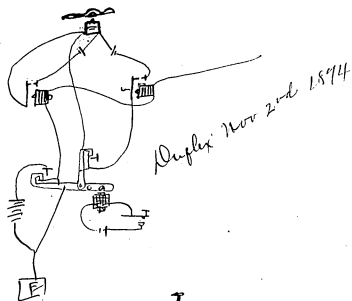
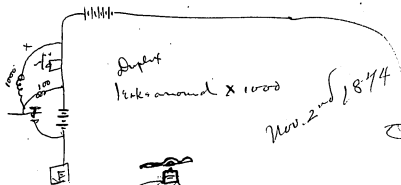


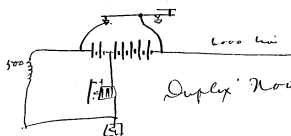
Transmission with same direction

59

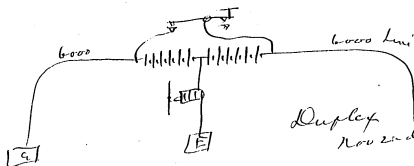


Sept 12 1874
Edison

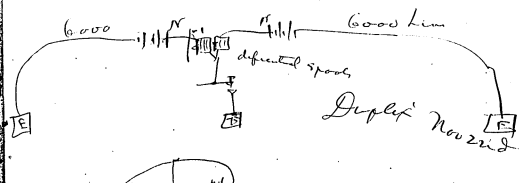




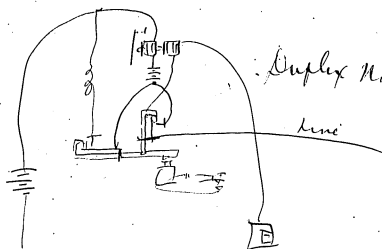
Duplex Nov 2nd 1874.



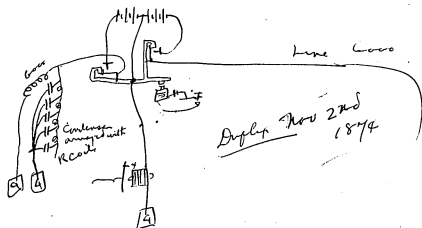
Duplex
Nov 2nd 1874.

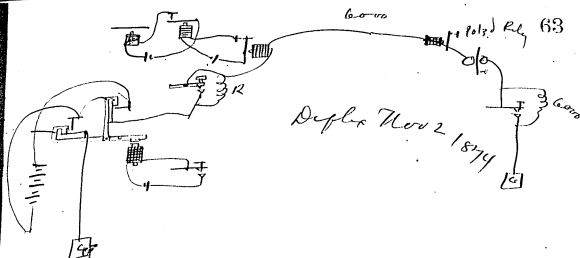


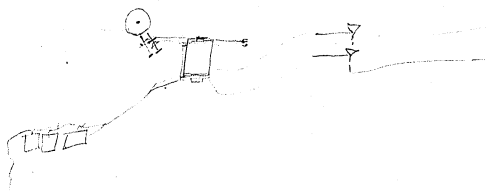
Duplex Nov 2nd 1874



Duplex Nov 2nd 1874

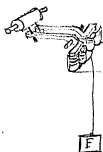






Michelson

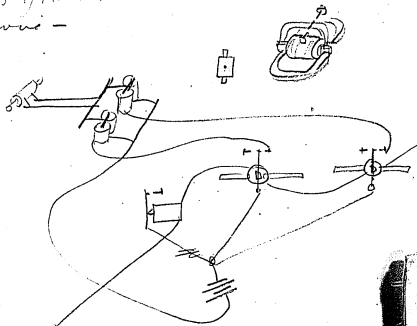
Exhibited
about that
time



Sept 1870

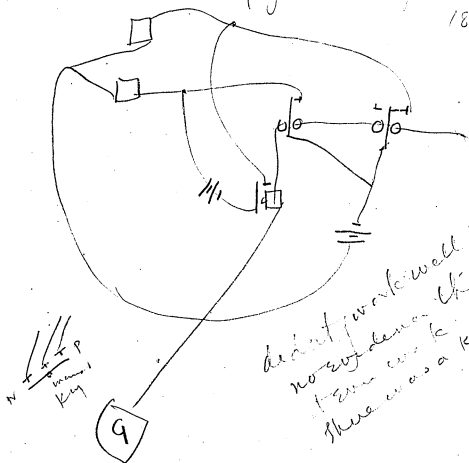


Came to Gillingham about this time to have
1. make a two pen register, like this
Get the best of the pen register deal
to see you can use the 4 pen register
in 1 wire -



66

This is the idea given N
by Gilliland given near
1870



didn't work well
no evidence that
there was a kick

Commenced the duplex
idea, notation & notation
of 1873.

Laboratory Scrapbook, Cat. 299

This scrapbook contains only a few dated entries, covering the period May-October 1873. Most of the laboratory notes and drawings are by Edison; some are by Charles Batchelor. They concern telegraphy, particularly chemical and printing, and contain many examples of both printed and chemically treated tape. There are also unused printed forms from several telegraph companies, as well as four pieces of correspondence (one by Edison), a brochure from the Electric Railway Signal Co., a circular from the Galvano-Faradic Manufacturing Co., and a clipping on perpolar induction. The cover is marked "Y." The book contains 306 numbered pages.

Blank pages not filmed: 2, 4, 6, 8, 48-49, 55, 76-78, 80-82, 84-306.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

with Ferridcyanide Solution - of Ferridcyanide. 1 lb of
Salt (Chl Sodium) gal water, attempts to increase delicacy
by the addition of following.

Muriate ammonia - small quantity.

Sulphur Column

Stearic Acid

Hydrochloric Acid

Cincinnati, Ohio

Nebo Riverside Indian

Spl's - Con'sphere

2nd Acid & Flav. (acid)

Sul Pot

Cash Redemption

Exp. 11/10/1910

المذبح

Bi-Florida News

2. - Cobalt

Suppose that Soda

Julph. P. da

R. J. Davis & S. D. P.

Pyrogallus a

1/4, 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836,

Phthalic acid

The Star Line

Re. P.

Sul Cophe

orange test

Benzene R.

Citric Ac.

Chromic R.

Potassium Nitrate

Ammonia

with Soda

Oxide of Hydrogen

Praline Oil

Alum

Silicic Acid

Ammonia

Ferric Pot

Manganese

Mercuric Salt

Spells

Fulvic Acid

Lactate

Mur. of Pot

Salt Symplicite Nitric

Silicic Acid

Formic Acid

Poly

Not a pure a

Poly

Nitric Nitro

Bichrom Pot

(Choose text page 77 to 87)

Ferricyanide Solution

Chl. Lime ^{signif. mark light yellow} soon bleaches
 Citrate Magnesia. ^{whiten} paper slightly mark faint
 Cyanide Pot. ^{mark inferior blue} faint yellow mark inferior
 Phosphate Soda ^{blue} ^{slight blue quite strong} very colors out
 Carb. Pot. + ferid in excess yellow mark ^{very} ^{slightly}
 Aqua Amm. drab mark inferior very
 Boric Acid Blue - ^{good} slightly inferior X
 Silicic Acid " " inferior does not color
 Sulphate Pot. " " " slightly
 Alum Ac. " " " very
 Carb. Soda light blue " " "
 Sulfate Soda " " " slightly
 Sulph. Copper " " " "
 Ferric Acid " " " very
~~increase in further exper good~~ X
 Acetab of Lead inferior
 Alum "
 Cyanide Pot. yellow " " grey
 Carb. Ammonia drab light " very
 Sulfuric Acid Insoluble
 Hyposulphate Soda same as original
 Murexide ^{mark} ^{endangerant} ^{mark} ^{slightly} ^{inferior} X
 Sulphate Lime no mark
 Sodium Ac. no change
 Sulphur & Calcium blue mark inferior very
 Sulfate Pot. blue inferior

Mineral of Tin is not good without salt.
 Benzoic Acid blue mark inferior very
 Galls " " " very
 Acetate Manganese " " "
 Ferrocyanide Pot " " "
 Nitroprusside sodium " " "
 Spirit of Camphor " " " slightly
 Chromic Acid " " " very
 Nitric & Pyruvic Ac " " " blue
 Hydrofluoric Ac. " " "
 Sulphur flowers front mix at all
 Oxalic Acid blue mark inferior slightly
 Chloric Acid " " " "
 Potassium Sulphocyanide " " "
 Malic Cobalt "lightest" " very
 Silicate Soda "blackest" " slightly
 Bichromate Pot Ragged dark blue mark " "
 Ammonia bit of Lion green mark " "
 Bi chloride Mercury " " " slightly
 Bi Chromate Pot & Sulph Acid best when just come.
 our pads to light green superior.
 Auric cyanide excess " "
 Starch excess best yet so far.
 Sulphuric Acid better than regular darker mark
 Nitrate silver deeper mark than regular
 Black Ox Manganese light green inferior
 Sulph Acid & Ferrocyanide Pot alone " very
 Peroxide of Iron good deeper than regular
 but ragged marks

3.

Gallii Acid Blue mark Superior slightly
Hydrosulphuric A. inferior

①

Ent

Make three large Secondaries with Calland jars and pure water to get a shorter after charge.

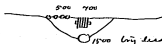
Roughen the surface of the electrodes to allow of the escape of the gases more quickly so as to give a shorter after charge.

Try 6 plates copen 1 inch wide 4 long with two thicknesses paper in between moistened with pure water first & salted if unsatisfactory

Ent

Test with line of relay alone then shunted with Secondaries

The shunt should be placed thus -



On the way to be practical must be much less
OK. No shock & little gas on line

Try both ways the relay should not stick this way.

②

14. secondaries well salted with the ends of
Electrodes barely touching the water see
if the gas does not escape quicker and
thus send a longer primary shorter after
current.

Also use wires of $\frac{1}{16}$ inch percha, in
well salted water and bare their ends
inches at end & coil sink to bottom of
bottle. The theory being that owing to
the increased pressure the gas will be
forced up owing to light speed of travel

The light with charge is probably due to
the after charge sticking in the battery

make a secondary thus



check cap, then stand, then put P; then Cap

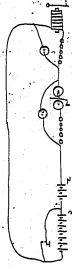
②



put p 10 disks

cut

Reverse current through back point Super
Relay and polarized shut as shown
see of better result obtainable

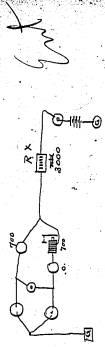


Set well at the secondaries and
Ground internally to a fine relay or ring
poles. Then take 6 cups battery with the
large ends in hand and connect to

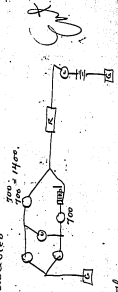
4
 successive portions of battery for an instant say 6 at time if the sections are charged quickly. This will probably be a continuous current from Condenser battery. Effies see which is strongest the original 6 or the 30 secondaries it may be that a reversing contact maker might be applied to a large number of secondaries using a small charging battery and a continuous current obtained having the same tension as the supply of secondary i.e. if there were 100 secondaries and 6 regular cups the tension would be that of 100 cups but the total quantity would be only equal to 6 cells increased of course by internal R of secondaries.

Sketch a relay of "X" R with one same R put in bridge, I'm not sure that the induction due from both will go on line one may kill the other. This makes just one more point increase by the ability of the light.

Test to ascertain if there discharge from a magnet is lengthened by an increase in the resistance of the circuit in which it discharges.



Increase the length of R of the discharging circuit but insert a gal in 'main' so that by reducing the R of RX the same strength of current is had but the discharging circuit is doubled.



The latter ought to give a weaker but longer discharge if not then the discharging circuit is

find out what that clicking thump is on opening ckt on wet paper =

Try this



See if stops induction - if so see if relay O.K. then reverse conn.

Try this



Try this

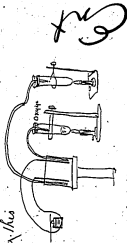


Then with coil alone inducting R to " " " "

Keep same. No good

(2)

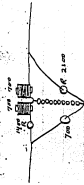
Try this



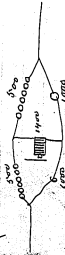
Two platinum electrodes, water heavily acidulated with sal acid, pass a stream of oxygen and hydrogen down by electrodes see if generates current. Try Black Ox Mang. chl. Pot. Ox. Zn. Zinc + Sal. A. Hydrogen try common gas. If don't work try adjust volume gas so there be 1. H 180. don't work then use iron replace one platinum with iron. Try oxygen alone. Try alone. Then try Zinc with H + platinum with Ox. no acid, of if acid get regular. Current deflection. see if gases add to

try

Try this first on 100 line to see if it kills
induction, second to see if relay dont
click on second closing



Try this



Try this



See if any induction from this



(2)

3

Let 6 cups of Carb. completely run down
try if this dont give heavy with and
hardly any after =
a played out Carb battery as when first
closed along then weakens to nothing

Try this 6 cups carb



Heat iron receiving pen with glass tube
having fine end attached to rubber
tube & gas - see if delivery
increased

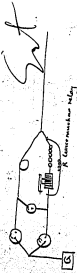
Discharge 732

Tin foil strip, paper over it, salt.

hydrogen reduces the oxide of tin which is always
on tin and if the foil be now treated with

a little nitric & pyrogallic acid they come
out black - the many irregular sides

Try this: The placing of the secondary battery in the direct circuit instead of plant alters its action as regards relay but not as regards emf. & by placing it this way all bad effects on relay may disappear.



(2)

Get

Alcohol.

3 Eggs for albumen

Charcoal

White Sugar

Onions

Red beets

Red Cabbage make solution

Syrup of Violet

Petals of red roses

Rhubarb.

Brazil Wood. } test papers.

Geranium

Silver wire for pens

Magnesium

Palladium

Copper

Zinc

Antimony got it

Aluminium

Bismuth got it

Sodium

Lead

Large lump Manganese

(1)

Plumber's pen

Nickel pen

Ten

Bias

German Silver

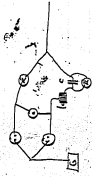
Platina drum

Dry lime sulphate

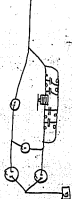
of an electro magnet is independant of exterior R. but it ought to be weaker, if not then tension must be very high -

Try sheet lead for secondaries. also sheet iron - Tin.

Try this

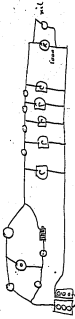


Try this



Kill the discharge.

9



when line can't be worked at 100 w without hunt
+ small magnet, & battery at winding end
connect as above & try get it. it will be
very weak but probably be good writing

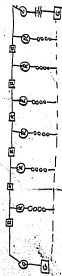
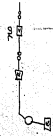
make a double ~~end~~ pen holder

- Try a line statically fixed in
Bridge in place of magnet
to steady it

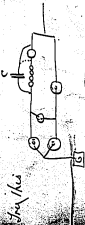
Try amount of discharge from 6 bottles with water alone and with various quantities salt, keeping the strength of main constant by def gal & R coil.

Try this

End



See of this don't imitate the cable change

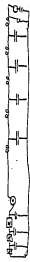


Try this

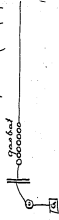
Try this to lengthen the discharge.



Try this no. next



Lengthening by gas & cond. discharge



also



7
with no static in first circuit, notice the induction & how it makes the dashes look. use enough battery if possible to record on perm.

Try with line well fixed, statically with magnet short if doubling the quantity will show any change thus



Try iodide solution, small quantity at rate of 1 lb to gal & iodine completely wet water with salt, then try at rate $2\frac{1}{2}$ lb to gal & iodine with salt. then try wet both without salt or rather try that first - use flour each case. Lay some regular iodide paper out to dry for use in experimenting.

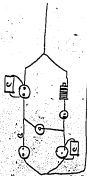
average 30 pieces per foil this. first dry paper parafined. then short foil. the short paper cut with solution salt, then foil then connect these two together. then wet sheet then foil then sheet then foil connect these together. then short receiving unit with it. also insert in main with no static case if no static of counter change both sides paper connect with it.



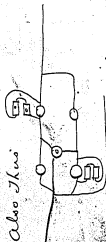
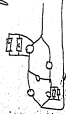
The effects on duplex relay by closing second coil adding Cudor etc can be studied in bridge

Try receiving with a battery at receiving end. make line with great amount static, and arrange this.

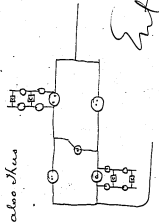
next p



insert magnet at 9 is former Expnt O.K.
 notice particularly the extra amount of
 induction given by the condenser
 then disconnect magnets and insert plain
 and study the action of the Condensers
 & add to them granitized say 2 condors
 Thus

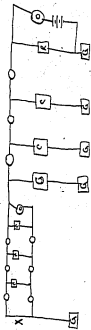


Ent



Ent

also Try this the expectation being that the receiver
 of the first circuit being at the transmitting end of
 the second circuit that there will be a back change

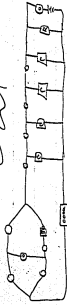


① Try it with circuit broken at X, the second
 circuit may have to have high resistance to
 get a back change. See what effect will be

allow for the balance R of the relay or magnet.

By this arrangement it is possible to determine the amount of discharge from any particular arrangement of magnets. Its resistances being balanced by the Rhes X. If it were well used it for determining the discharges

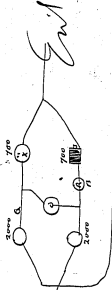
also try on this arrangement if 12 cup on permanently acting with gives any more or less induction also acting against arrange this



Try the effects of the addition of a Condenser to the branches containing the plain R Coils Thus

over

Try this, getting the inductive effect free from the main current and regulating the latter so that just enough may be used to make the clashes

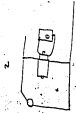


all being equal no main current flows through the paper but the inductive action upon the opening & closing of the main is generated within the first V and is recorded upon the paper. If now the R. B. is inserted with a slight R. then the balance for the main current is destroyed and an amount of main current proportionate to the resistance unplugged in B. passes through the paper. It is probable that a magnet may be inserted at B. and the R coil reduced so as to

Local current and causes an excess, the theory being that a reversal of the polarity of the iron core generates more induction than without.

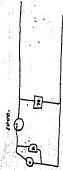
- Try both with and without second circuit.

Try without battery by just closing coil, then

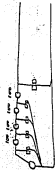


add condenser to it thus 2 notice effect.

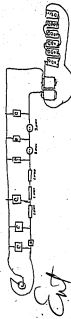
Try a double compensator; thus.



Ent



also



Duplex relay work over line by induction currents, arrange in first place with battery direct with 300 ohm shunt, and small relay in. with first magnet shunt at receiving end and increase resistance so that it is impossible to get 100 words then replace by double coil relay and work with induction currents, see if 100 can be got with induction currents.

Cost 10 rolls perm with Boston paper for records,

①

arrange as above if induction don't work and replace shunt and use Duplex relay as receiving shunt, one coil only. Then arrange a box of battery with one of the round Bradley R boxes with second coil & unplug R till the main line current neutralizes the

②

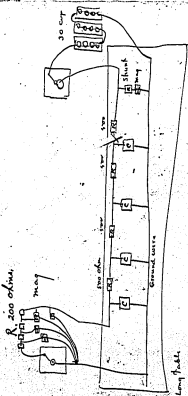
Try. Ferrocyanide & Nitrate Ammon. & after
decq. dip in Sol Nitro A & Pyrogallie A

Treat that tin foil with solution call
- go for checker marks on the tin to mark
Eun insulate -

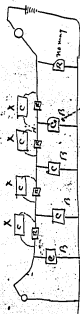
①

Try two large Secondary batteries, Calland
Jars, & two small both same R. made
so by less Salt in. large.

②



Try this & ascertain if the X Condensers can kill the B Condensers. The X Condensers may have to be three times as strong as the B Condensers.



Experiment on Boxes, 1 fine wire may 4.
Several equally much fine. Connected for
quantity & beam-^{ing} see which best.

Craven

Acetate Lead. C. Rose. $\frac{1}{2}$ lb.

Ammonia. Wash Cone $\frac{1}{2}$ gallon bottle. Pure.

Potash Antimony. Pure. 2 oz.

Biocarbonate Soda. 1 lb.

Bichloride of Mercury. Cp. 4 oz.

Bisulphate of Potash. Pure. 3 oz.

Bone Ash. 1 lb.

Borax and oil of sweet. 1 lb.

Borax. Powdered. $\frac{1}{2}$ lb.

Carbonate of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

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Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

Chloride of Potash. Pure. 1 lb.

for pers. Aluminum 40c dr 1 dr
 Bismuth #1 spec 1. Cadmium 75c oz 1 oz
 Chromium #1 spec 1. Indium #1 spec 1.
 Iron reduced by Hydrogen. 30c oz 1 oz
 Magnesium 60c dr 1 dr. Manganese pure lump
 containing Mang. Manganese 50c spec 1
 Molybdenum 50c spec 1. Nickel 20c oz 1 oz
 Potassium #1 spec 1. Palladium foil 20c gr 8.9g
 Potassium 75c dr 2 dr. Rhodium #1 spec 1
 Selenium 150c dr 1 dr. Silicon 50c spec 1
 Silver foil 200c oz 1/2 oz Sodium 35c dr 3 dr
 Thallium 50c spec 1. Tellurium 100c spec 1
 Titanium #1 spec 1. Tungsten 50c spec 1
 Uranium #1 spec 1.

#1 #20

Hydrosulphate Arsenic 2 oz
 Hydroarsenic acid 1 lb c of gold
 Iodine gold dust 1 oz get #1 at Carls
 Limestone 1 quint
 Lithium Pap 1 gr
 Molybdate Ammonia pure 1 oz
 Niter Baryte, pure Cryst. 4 oz
 Niter Cobalt. Pure Cryst 1 oz
 Nitral Potash pure Cryst 1/2 lb.
 Ni (100-Pure) Sodium Pure 1 dr
 Phosphate Soda Pure. 3 oz
 Manganese Microcosmic Salt. Pure. 1 oz
 Oxalate Arsenic pure Cryst. 3 gr
 Peroxide Iron Pure Cryst. 3 oz c of gold
~~Potash~~ Caustic Pot. Chem Pur 2 oz
 Pralocitron of tin pure 4 oz
 Sulphate Copper Pure 5 pound
 Sul Lime Pure persap 2 oz
 Sul Magnesia pure 1/2 lb
 Sul Acid. Pure. 1/2 gal bot
 Tartaric Acid per Cryst 4 oz

Protocliloride of Tin pure 4 oz
Sulphate of Copper Chem pure 5 pounds.
Sulphate of Lime precip 2 oz
Magnesia pure $\frac{1}{2}$ pound
Sulphuric Acid pure. $\frac{1}{2}$ gallon bottle
Tartaric Acid pure cryst. 4 oz.

Yours.

Ros A. Edison

Large perforator.

Three Key perforator

recent

Transmitter. Belt

now used roller pens

iodine paper, more than 1 lb to gal water with or
without a starch compound.

Perisulphate, red prussiate of potash & alkaline
salt solution.

Test Galls ^{Hydro} Sulphuret of ammonia & alkaline
solution

Alkaline & Logwood solution.

Sulphuret of potash & alkaline solution

All the circuits upon the magnetic

principle - Combination with Morse - quantity ^{magnetic lines}

all the circuits upon the condenser
principle. Shunted Relay, ^{sending bell} Condenser shunted do
Ring with second ^{Condenser}

Send along line Roman letter principle

The paper.

The perforator.

The 5 wire machine do with five roller
pens. Brief description of 1 wire machine.

Mention that the letters may be
embossed - Morse.

Carbonate of Ammonia pure. 1 pound.
 Carbonate of Soda pure. 1 pound.
 Chloride of Ammonium pure 1 pound
 " Barium pure cryst. 2 oz.
 " Calcium " dried 3 oz
 Chloride of Lime pure. 1 pound
 Chlorine Water 1 pound.
 Cyanide of Potassium pure. 3 oz.
 Ether pure. $\frac{1}{2}$ pound
 Hydrosulphate of Ammonia. 2 oz.
 Iodine. 1 oz.
 Lime Water 1 quart
 Litmus paper 1 q.
 Molybdate of Ammonia pure. 1 oz.
 Nitrate of Barite. pure cryst. 4 oz
 Nitrate of Cobalt. " " 1 oz
 Nitrate of Potash " " $\frac{1}{2}$ pound
 Nitro-prusside of Sodium. pure 1 dr
 Phosphate of Soda pure 3 oz
 Microcosmic Salt. pure. 1 oz.
 Oxalate of Ammonia pure cryst. 3 oz
 Perchloride of Iron " " 3 oz
 Caustic Potash pure 2 oz

Dax & Dash System

Large perforator.

Free Key perforator recent

Transmitter. Belt now used roller pens

Iodine paper, more than 1 lb to gal water with or without a starch compound.

Ferridcyanide, red prussiate of potash & alkaline salt solution.

Hot galls & Sulphuret of ammonia & alkaline solution

Alkaline & Logwood solution.

Sulphuret of potash & alkaline solution

All the circuits upon the magnetic

principle - Combination with Morse quantity

All the circuits upon the condenser

principle. Punctured Relay. Condenser shunted do

key with sound. Roman letter principle

the paper.

the perforator.

the 5 wire machine do with five roller

pens. Brief description of 1 wire machine,

mention that the letters may be

embossed - article.

MESSRS L & G.

Newark Sept 3. 1873.

I see you do not fill last order complete, please keep missing articles on order book and when you get enough to fill a small box, ship to Thomas A. Edison 10 & 12 Ward St Newark N Jersey. where please address any letters, send box C. Q. D.

Please send following order to me C. O. D.

- Acetate of lead. pure. $\frac{1}{2}$ pound.
- Ammonia Water Conc 1 $\frac{1}{2}$ gallon bottle
- Antimoniate of potash. pure. 2. oz.
- Bicarbonate of Soda. 1. pound.
- Dichloride of Mercury. C.P. 4. oz.
- Dichloride of Platinum in solution 1. oz.
- Bisulphate of potash. pure. 3. oz.
- Bone Ash 1 pound.
- Borax powdered $\frac{1}{2}$ pound

(4)

Dot & Dash System

Large perforator.

Three Key perforator recent

Transmitter. Belt now used

Sober paper, more than 1 lb to gal water with or without a starch compound.

Terrioguanide, red prussiate of potash & alkaline salt solution.

Net Galls ^{Hydro} Sulphuret of Ammonia & alkaline solution

Alkaline & Logwood solution.

Sulphuret of potash & alkaline solution

All the circuits upon the magnetic

principle - Combination with Morse quantity

All the circuits upon the condenser principle. Shunted Relay, ^{Sendy bell} do they with sendy bell, Condenser shunted do sendy bell Roman letter principle

The paper.

The perforator.

The 5 wire machine do with five roller

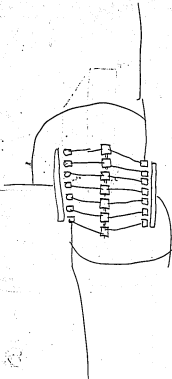
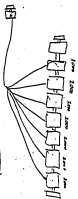
pens. Brief description of 1 wire machine,

mention that the letters may be

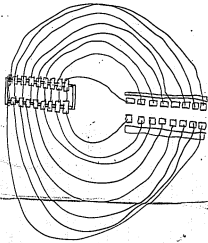
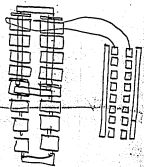
Embossed - Morse.

(5)

①



②



2000 of one each

4/1

THE ONLY
RELIABLE AND EFFECTUAL METHOD
AND MOST SUBSTANTIAL MACHINE

Prevention of Alteration of all Monetary Documents,

PATENTED MAY 6, 1873.

Philadelphia, Sept 30 1873

Mr. Jas. A. Edison,
Newark N.J.

Dear Sir:

I have today sent you a copy of my
recently obtained Letters Patent,
which I hope will duly interest you.
It is my desire to sell the same in
State Rights. Now to render it a quick
sale I will sell you the State Rights
for New Jersey, for Eight Hundred
Dollars in its Equivalents.
Please give the matter your attention
& you will find it of great value
offered throughout the United States.
I leave it to you whether you
want it or not.

Yours Very Respectfully
J. S. Fisher

Halbrand

Try this.

Inset between as shown the round rheostat.

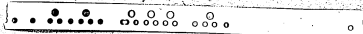


Try tomorrow if the Box can be left on first button & receive from W & regulate by Rheo, to long then the side of shunt in which receiving instrument is,

Have Serrall prepare Cavalry Qaym that instead punching Roman may be embraced by Serrall machine & the Serrall the left leaves & Serrall circuit

CONSISTS OF TWO OFFERS WITH THE RENT
BOTH RECEIVED IN UNUSUAL MECHANISM

Call to try the output again



HALF RATE MESSAGES

The Western Union Telegraph Company will receive messages for all stations in the United States East of the Mississippi River, to be sent during the night at **ONE HALF THE USUAL RATES**, on condition that the Company shall not be liable for errors or delay in the transmission or delivery, or for non-delivery of such messages, from whatever cause occurring, and shall only be bound in such case to return the amount paid by the sender.

No claims for refunding will be allowed, unless presented in writing within twenty days.

O. H. PALMER, Secretary

WILLIAM ORTON, President.

Read the following Message subject to the above terms, which are agreed to:

155

NOTIT MESSAGE

THE SOUTHERN AND ATLANTIC TELEGRAPH CO.

Abstract

PROMPT DESPATE

CULTURE OF THE FUTURE

61 NEW STREET

P. O. Box 3624, New York, NY 10108



CONNECTING

1000

For more information, contact the author at edward@edwardmiller.com.

THE WORK OF CASE

$$\Delta_{\text{eff}}^{\text{eff}} = \frac{1}{2} \left(\frac{1}{\Delta_{\text{eff}}} + \frac{1}{\Delta_{\text{eff}}^{\text{eff}}} \right) = \frac{1}{2} \left(\frac{1}{\Delta_{\text{eff}}} + \frac{1}{\Delta_{\text{eff}}^{\text{eff}}} \right)$$
[illegible][illegible]

257

Received from
Philadelphia Pa.

190

THE WESTERN UNION TELEGRAPH COMPANY

THOMAS T. KENNEDY, General Counsel
New York
WILLIAM COTTON, Pres.
D. H. PALMER, Sec. } New York

Dietary

for —

1730218

4

----- HAS JUST BEEN RECEIVED AT THE OFFICE NO.

LEADS TO CONSIDERABLE LOSS OF TIME

Model A9: 7000000

DATE				CHARTERED BY STEEL				NO. STEEL CHARTER				DATE				CHARTERED BY STEEL				NO. STEEL CHARTER				DATE			
No.	Per	Per	Per	No.	Per	Per	Per	No.	Per	Per	Per	No.	Per	Per	Per	No.	Per	Per	Per	No.	Per	Per	Per	No.	Per	Per	Per
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2				2				2				2				2				2				2			
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31				31				31				31				31				31				31			

The American Union Telegraph Company.

1897

NAME OF CARRIER

ADDRESS

TO WHAT
PLACE

PERMITTED

FROM WHAT
PLACENo. of
WEEKS

Land

Other CARRIER

This CARRIER

Other CARRIER

This CARRIER

Other CARRIER

This CARRIER

No.

Co.

CABLE REPORTS, SOUTHERN AND ATLANTIC TELEGRAPH COMPANY.

CHIEFS THIS OFFICE, THIS OFFICE CHECKS,
This Line, Other Lines, This Line, Other Lines

NAME OF OFFICE,
Credited in Account with

No. of TOTAL CASH
Words RECEIVED.

FROM WHAT PLACE

SIGNATURE

TO WHOM ADDRESSED, TO WHAT PLACE

No. of
Message

Pro 12

~~SOUTHERN AND ATLANTIC TELEGRAPH COMPANY.~~—Monthly Report from

for the i-curve of

161

Account Current of

[illegible]

Journal General Book - say Charles D. Co

SOUTHERN AND ATLANTIC TELEGRAPH COMPANY.

No. of Message TO WHOM ADDRESSED. TO WHAT PLACE SIGNATURE FROM WHAT PLACE No. of Words. TOTAL DASH Words. RECEIVED. NAME OF OFFICE CHECKED IN ACCOUNT WITH DEDUCTIONS THIS OFFICE CHECKS. This Line. Other Lines. This Line. Other Lines

5 John Smith Samuel John Brown Charles 20 1 00
 6 John Doe do Richard Brown do 10 - 50

The day's business at each office is entered as fast as it comes in, in Morning, & at the close of the day the messages are classified as far as to put all that have been sent from any one place to any other place, & then. The same are entered in this Book, in regular & connected order, ending between the different places where messages have been sent.

Very sensitive =

Chl. Sal - not good

Aurochloride Sodium Nitrate ammon
Ten Per - Can interfere with Iron

Purple of Cassius

4 Line

Specimen of a Roman letter Telegram
Transmitted over two circuits, Independent of
all synchronism or machinery -

THIS IS THE MINTER OF

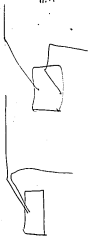
THE ORIENTAL MINTER, IS A

IS THE MINTER OF THE ORIENTAL

THIS IS THE MINTER OF

THE ORIENTAL MINTER, IS A

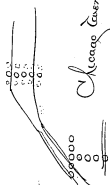
RELAY



①

THIS IS AN AUTOMATIC TELEGRAPH

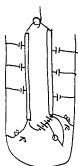
INT



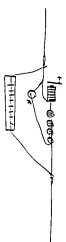
Shall be likely receiving roller for 4 line printing. 2. Run set ahead of the two halves as late as the key setting ahead the rollers

②

Two static lines from



In the two same direction, about the common relay with plan a secondary battery - to kill all discharges. Then short that with compensating box - kind of this



Key on static line
Key the duplex on
static line & static paper

$\frac{1}{2}$ Salt $\frac{1}{2}$ Gallon Water. The solution

Dipped in

Hydroch. Am. little very black mark

" " excess " " no better

Nitrate Silver no effect

Nit Silver, Hydroch. Am, & Acetic Ac. no effect.

Nit Silver & Formicacide no effect

St Campha " "

Pot. manganate Pot " "

" " & Acetic Ac. " "

Morphale Soda " "

Carbonate Amm " "

Aqua am " "

Sulphurous Ac.

Malgalic Ac. faint mark at first comes out very black

Limes no good

Silicate Soda very slight brown mark.

Oxide Iron no good

Bichloride Merc. " "

Chloride Cobalt " "

Pot. Sulpho Cyan " "

Pot. Iodide " "

Nitro prusside of Soda " "

Caustic Potash light brown mark fades out

Testing for tests for

Phosphoxide Iron

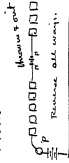
It is possible that if 40 cups were kept permanently on the cable 15 signals could be given with 10 cups at sending end. Better than if the whole 50 were used in ordinary way.

This

84



allied static

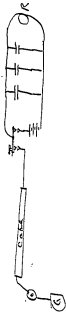


③

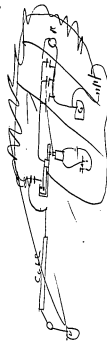
Review with Contin
I think with Shalloed Recy
drum and pens not little ahead
That by using 14 Cups Each
lines to drums, and sending
batter & putting in R
of 300 ohm send line
it will work. Ohun bin
batter is for the purpose
of showing backly divide
according to the Resistor
that I find several point
mark the S. in
mark =

①

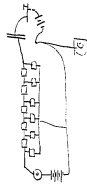
Use the static charge to work the cable thus -



if want put end to ground use duplex key



Cable



See what speed obtainable on 9000 ohms R with 1. cup battery. Jodite. if no mark expect on iodide paper till get a mark.

Try this



also list of a voltage battery put in current immediately after the dots has been sent & the sending end insulated, will have any

any effect in stopping the flow from the Condensers, use same number of Elements to Kill discharge from Condensers as to send with if it has no effect. Then it is perhaps possible to transmit with Voltage & Static at same time and perhaps Static Compensation or reverse of static is better than Voltage. Try with 20 p and 20 p.

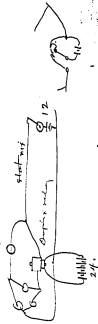


Now try all bottle batteries, with discharging shunt of high R at sending End so as to enable Secondary to send an opposing Current see if much difference.

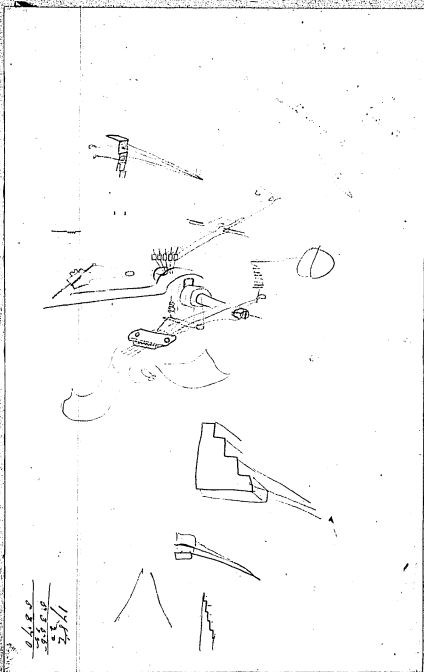
I have noticed the a Morse Relay on a regular line works much cheaper with battery at both ends than when the battery is at one end only.

when the latter is used the N^o etc stick just as if caused by static. The battery at receiving end remains of course on line while the other is off when the key is opened this may have peculiar effect on the retention of the Charge or the quicker discharge. Try it =

Discover if the induction from a relay is as great with the core nearly saturated with magnetism as free. Thus



The Current going in both directions 24 making N S. & 12 adding to Try what effect 24 mkg NS & 12 mkg SN



Lemuel W. Sorrell's

OFFICE FOR INVENTORS

American & Foreign Patents,

119 & 121 NASSAU STREET.

(P. O. Box 4021)

New York, Oct. 6, 1873.

O. A. Edison Esq

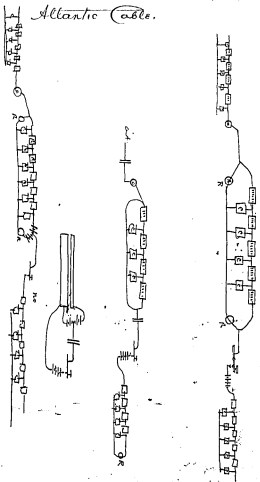
Dear Sir

The cups of liquid with copper conductors in them are shown in your patent 141,776 in the blank to earth, and also on -dividers and batteries. The cups are shown in main line in No 141,773 but not in any other. I discover in the main cups and resistance introduced as proposed by you when last you sent them: the way is clear I think - The other chemical cases are ready for examination and signature.

Yours truly
Lemuel W. Sorrell

①

Atlantic Cable.



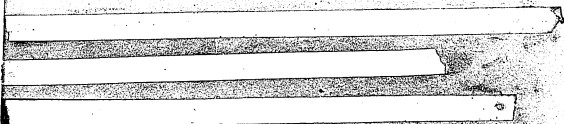
②

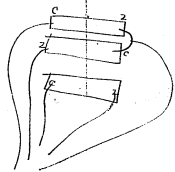
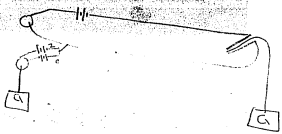
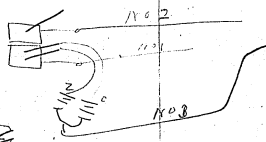
47
 Set the induction on a clear line of the relay in the balance. Then cut a line of same R but fixed statically test the amount & character of the induction from same relay. The object being to see what effect the gradual decrease in the strength of the main wire has upon the inductive course.
 Try same with secondary batteries

Make 4 bottles secondary battery. place in balance, first fill with 4 penny weight of Muriat ammon - then
 Sul Soda.

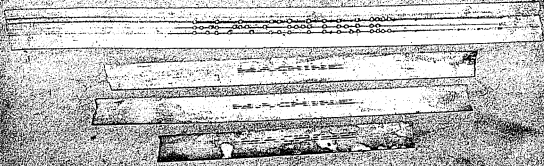
Alum
 Bichrom Pot
 Sodide Pot.
 Nitric A. 5 drops.
 Sulph.
 Nitric Ammon
 Acquisit ammon

{ 4 several other than
 do what phenomena
 accompany the
 different elements
 like rail.
 Sulph.
 Sul Acid
 Ferriol -
 Sul Zinc

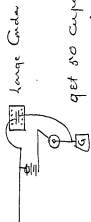




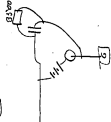
2 wires



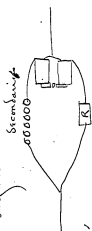
Send to Washington with this arrangement



also.

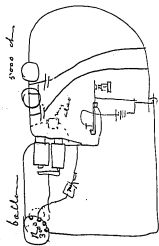


Try this



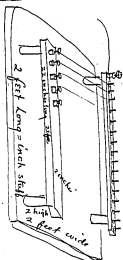
Try this Duplex

Then



(2)

Have old man make this.



40 Rounding 'shaft' small = punched all over.
Have Tom forge the place "Kiss" =

HERE! WFSZADJTFASVN AA
VERY NISE RUM THEY SELL THEE CHEESE AND TRENTON KNACKERIS ON' END BAR YZ 9

OCTOBER 25, 1973

built for Mr. Henry Morel, of the *Société de l'Éclairage*, of Ghent, Mons, Thiermon, and Co. have made a specialty of these high speed tests, and there appears to be constantly increasing demand for them. The firm are now constructing some of these machines with compound engines.

PERIPOLAR INDUCTION.

Those of our readers who have attended the very interesting lectures delivered by Professor May, of the University of London, on the subject of magnetism, will remember the striking experiments which he performed with the aid of the large electro-magnet belonging to that institution, and a disk of copper suspended so as to be freely swung between the poles. When the magnet is uncharged, the disk rotates, like a pendulum, from side to side with perfect freedom, resisting the action for some time after the impelling force is removed. If, however, a current is established, converting the masses of iron into actual magnets, the vibration of the plate is almost instantly stopped; an invisible rotating medium appears to have been formed between the poles, through which the disk is unable to pass, or, if forced through, acts, as Professor May expresses it, "as if it were presenting chess."

On conducting an experiment somewhat similar to this, Faraday was led to the conclusion that the arrest of the copper plate was due to induced currents produced therein. In other experiments, which we will not here describe, the existence of these currents was demonstrated by the direct exploration of a disk of copper turning before a magnet, an operation which defined the paths of the currents with certainty. Foucault modified Faraday's mode of investigation by arranging his plate of red copper on a horizontal axis, and revolving it by suitable mechanism at the rate of 10,000 turns per minute. The disk passed between the two extremities of the soft iron core of an electro-magnet, to which a current could be established at will. As long as the latter remained locked, the plate, when swiftly rotated, would retain its motion for some time; but as in the case already cited, a prompt stoppage followed the establishment of the electrical force. Foucault intended not simply to repeat Professor Faraday's experiment, but he wished to study the results incident to the application of a force sufficient to continue the rotation of the disk in spite of the obstruction. It was found that, to accomplish this, considerably mechanical energy must be expended, which could be calculated at the rate of work now and above that necessary to cause the rotation of the disk, maintaining a given velocity; in other words, that rendered necessary by the effect of the current, was the greatest, and Foucault determined it to be transferred into heat. This conclusion was soon justified by experiment, as it was found that the temperature of the disk became elevated to a degree appreciable by the hand; and when the rotation was prolonged for two minutes and the current produced by six Daniell elements employed, the melting point of wax could be attained.

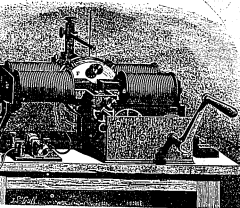
We have now given, of the salient points of this study, Faraday's experiments, as particularly notable investigations. In motion. M. Le Roux, however, has recently devised the apparatus represented in our engraving, and, besides, investigated that which he calls "peripolar induction."

Supported by two feet on a self-constructed table, four coils of isolated copper wire, so arranged as to be connected with a battery by means of the commutator, C, by which the current is interrupted or re-established at pleasure. Within these coils are cores of soft iron, the extremities of which extend beyond the wire and form the poles of the DP, is placed symmetrically in the center of the apparatus and parallel to the axis of the coils, and turns on a horizontal axis which extends between the opposite extremities of the iron, as at A. At this point is shown the plate which, with other gearing, transmits the motion of the handle to the disk, so as to cause it to rotate 180 times per second, or about 10,000 times per minute. To the side of the core of the opposite coils and below are fixed two poles of soft iron, P, between which passes, though without touching either, the copper disk, D.

Thus arranged, the machine forms a powerful Foucault apparatus, with which the experiments above indicated can be repeated. But above the cores of the magnets are placed other pieces of soft iron, P, arranged similarly to those marked P', which, we have stated, are fixed below. When this portion of the device is in position, all the pieces become magnetized by contact with the electro-magnet; as is evident, the disk, D, in its entire extent, is submitted to the action of a magnetic field presenting the greatest symmetry in every direction. Here, however, the contrary of that which has been heretofore observed takes place; the

rotation of the disk is so easily accomplished, when the current passes so when the circuit is interrupted; and that the same resistance experienced in the Foucault apparatus is not here encountered is proved by the fact that the copper does not become sensibly warmed.

The current neutralizes passes, and also is dissolved in the battery. Here then is expended energy which should manifest itself somewhere. The study of the effects which should be produced by reason of the induction led M. Le Roux to admit the existence of a current running from the center of the disk to the circumference; and he proceeded to verify his conclusions. To this end, a vertical metal support is placed in contact with the axis of the disk, and a horizontal rod fixed to this support terminates in a copper wire, the end of which rests on the periphery of the disk. When the latter is turned, with an current passing, no special effect is observed, except the slight warming of the copper wire by the friction. If, however, the flow of elec-



PERIPOLAR INDUCTION.

tricity be established, at that instant a continuous series of sparks issue from the point of contact of wire and disk, thus denoting the existence of a very energetic current in the circuit formed by the disk, its axis, and the various pieces already described as arranged in connection therewith.

It is in the fact of there being this current, as predicted by theory, that M. Le Roux's idea of peripolar induction is based. No practical application of the discovery has been made, but it is very interesting, in that it confirms many theoretical ideas regarding induction. The machine represented was by Blumhert, the celebrated manufacturer and inventor, before many French scientific societies.

STEEL AL U CAN. WE PRINTING OPRS. NEVER WIL IN GODS WORLD MAK

ANY IMPROVEMENTS. SEND ALNG THT NEW RELAY. AND FR GDS SAK SEND

HF DOZ OF THEM. HERE.. WANT EM FOR THES. DMD WIRES.

CAN SAY THT NOW THT. ECKERTS ON BRINY DEEP. A UR. DMC OLD AB

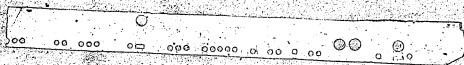
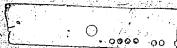
UR DMC OLE AROMATIC LINE HP UAAAGPVMAB UR DMC OLE AROMATIC

LINE GOT FOUL OF OURS TODAY. AND WE GUSTED. EM. UP AL DAY

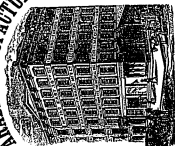
OFS TO SEND.... ONE HUND. THOUS WDS. AN HOUR. BUT TH. EXAMINER. AND

OTHERS COMON SENSE. SAY HES A DMD. FUL. AND DNT NO ANYTHG ABOUT IT.

WHT U DRIVING AT NOW. ROYCEYZ PUZCH



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187

J.B. Mulvey

De: Mr. Mulvey

and herewith enclose Receipt
for Auction and assignment
of same as per agreement.
May I beg of you to forward
payment of check as soon for
the \$8000. as I have lived in
expectation of this for at least
three months and I am in
rather unfortunate circumstances.

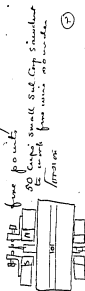
①

See what direction the discharge is from a coil
of iron wire no core. — See if a solid
iron coil will attract an armature at the end.

On Bottle or Glass Rheo tube line,
See if judicious placing of fine iron
as leaks equals combined water will
completely neutralize outflow or secondary
current. — See what proportion it takes

When get artificial 10 Condens &
R Boxes see what is lowest amount
of leakage of magnets along it will
completely clear line.

Have a Palamonde Relay made.



②

Problem - Get a relay to send
a current opposite to what it
does now

See if a Relay Opal of iron wire don't
send as much as one with Copper wire
if so the iron has advantage of
having more resistance,

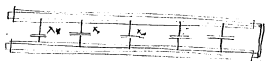
See if Relay sends more induction
with numerous pieces of iron in
contact with back - also with
front. Try effect of pieces
of brass between armature &
Core - see what effect on
induction also on reversal
for supply is same every



Bridge Wheatston
Magnetic Condenser

Connect one armature in foil Condenser to one pole magnet & other armature to the other pole =

Wind a Relay Magnet with long roll tin foil.

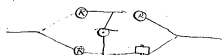


sheet iron plates

10 feet long



Try following Experiments upon the induction
effect of magnet, made as follows in
Bridge

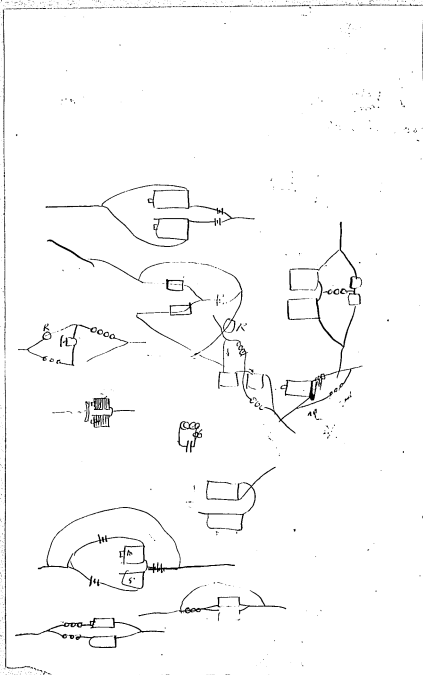


supported by Brass

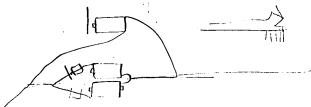
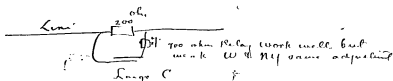
Sheet iron tube 1 foot diameter
wound 6 layers 23 wire.



10 feet long wound 23 wire 4 layers



Diode
See if static killed with this and if there is any
stick to Relay



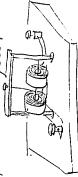
In one cell secondary with clean coppers with distilled water and God Kali - also replace coppers with platinum or carbons.

Associate with the iron receiving pen or platinum pen very close to it so that the oxygen set free at the platinum pen shall form the protoxide on the iron, theory being that iron when so associated is more susceptible of oxidation, also probability that $\frac{1}{2}$ of effect is lost by polarization iron pen which will be destroyed by the associated platinum pen.

Ascertain if anything will combine with protoxide iron to make it soluble in water if so add to Callaud battery to dissolve the yellow sesquioxide on the zinc due to the iron in the zinc. The Hg zinc works abstract their zinc from a compound containing iron pyrites & considerable percentage iron remains in their zinc.

①

Wet paper galvanometer - wind two bobbins so feet paper in solution CHL Sodium and wind separating with oiled silk, thin rubber cloth or gutta Percha foil.



In a galvanic battery try outside. Chloride Sodium and Carbon in porous pot. solution nitrate silver and carbon. Use new carbon & new porous pots - also replace carbons with platinum if unsatisfactory theory being precipitation of the chloride by the net silver will set up an active current.

Try same but use cold CHL sod outside & boiling hot CHL sod inside - porous diagram

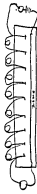
Try wet paper - sulphuric acid, and nut galls, on the passage of the current, protoxide of iron is formed. The sulphuric acid combining therewith forms protosulphate of iron or copperas, the nut galls will then strike an intense black forming common ink -

Make a Lomboni dry pile,

Make a condenser of sheets of copper and sheets of thin stove zinc.

Try Electrometer plumbago rubbed on paraffin sheets for Condenser

Make trough one side place long sheet zinc at intervals carbon. try effect.



Try 1 Cup then increase. see how many it

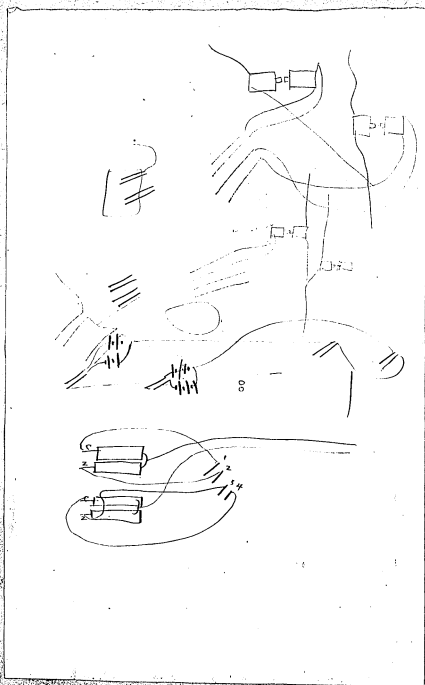
See if there is a noticeable effect produced in these modifications

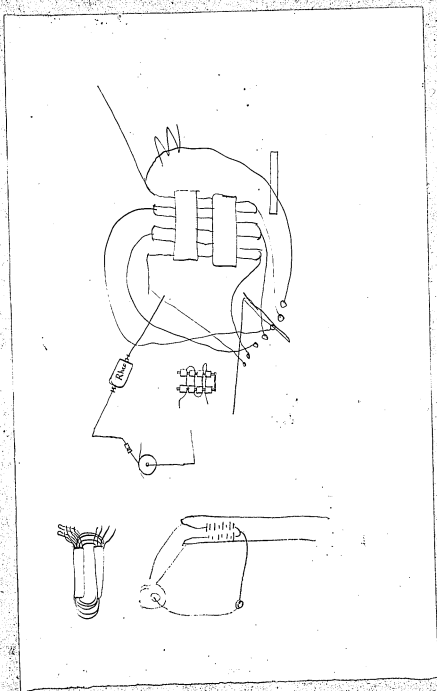


and



Theory being that in the centre of resistance or bulk of Conductor there is a nil point and that each side from that point the R is P & the other N or & that a battery on a R should if it is strong attract a finely balance magnetized needle to connection wire at zinc end its N end & at Coke end its P end
Try it =

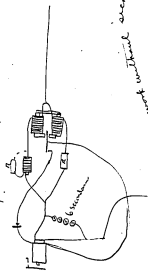




Try all the secondaries connected for quantity on a R of $\frac{1000}{10000}$ 6000 ohms.

in the centre 3250. Connect all the secondaries to ground or return and the other end to R through an R of 250 000 ohms. See the Change due to Secondary Action Use wet sliding

Duplex



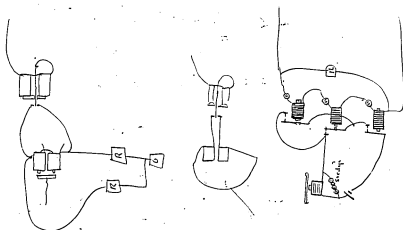
The Core of the pair'd R might be made to short ckt the Secondary when open.

takes to neutralize - use pure water from then Chloridium.

A galvanometer needle hugs the stop pin after the current has ceased. Theory. The needle being thoroughly becomes charged p one end N at the end statically & is attracted by pin - try connecting pin with galvanometer.

On a shop line static get its R. carefully then insert a leak of known R in center and get total R. & believe that in a submarine cable that there is a constant opposing electromotive force in the core against the battery & that they do not get the right R of the core.

7



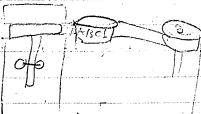
71152 7/10?

Station: Berlin. Französische Str. 33. Telegraphie

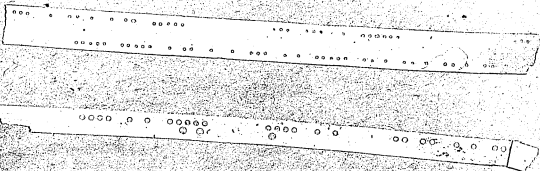
Wird die Übermittlung in der Sprache des
Senders, je nach dem 2. oder 3. Klasse
werden, nicht, bei 2. Klasse werden nicht
an. H. W. 1.

Deutsches Reiches.

Berlin Hamburg 8635 20 10/2 6 20-s = Frau Weisinger, Burgstrasse 14
Berlin = Ich erwarte Georg morgen bestimmt Clemens Reist bereits Mittwoch
früh telegraphiret wann Georg eintrifft = Wilhelm.



VOICI UN MODEL D'OUVRAGE FAIT
PAR LE SYSTEME DE TELEGRAPH
AUTOMATIQUE A TYPES PAR M EDSON.



F 3314-6 E

HA. HELD EDISON: WHT TH HEL U PROWLING AROUND THESE COMEN. INSTS. FOR

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SEMAPHORIC DISTANCE SIGNALS WITH REPEATERS,

AUTOMATIC BLOCK SIGNALS, SPECIAL SIGNALS

FOR TUNNELS, DRAW-BRIDGES, STATION

SWITCHES, etc.

YARDS, CROSSINGS AT GRADE,

SWITCHES, etc.

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Wm. J. N. Ashley,

Assistant Manager.

F. L. Pope,

Electrician and Supt.

HOWELL BROTHERS, Printers, New York.

Electric Railroad Signal Company

This Company, having perfected a complete system of Electric Railroad Signals, is now prepared to furnish the necessary plans and estimates, and to erect their improved Electric Signals at any point in the United States or British Provinces, upon short notice and upon the lowest terms consistent with a proper regard for thoroughly good and reliable workmanship and competent superintendence. The Company guarantee all instruments furnished and work done by them to give entire satisfaction.

For the Automatic Block System, railroad crossings at grade, draw-bridges, switch and tunnel signals, they have the only *Reliable System of Electric Signals* yet offered to the public.

These signals are not an experiment, being now in successful practical operation on several railroads.

This system of electric signals is fully secured by a number of patents already granted in the United States and other countries, and by others now pending, which are owned by the Company, and which will maintain its legal rights to the fullest extent against all infringers.

This system of Signals was awarded the *DIXON and FAIRBANKS* MEDAL for the best System of Railroad Signals, at the Centennial Industrial Exposition of 1876.

The following is a brief description of our system of "Sema-phores and Repeating Signals," which is specially adapted to single track roads, grade crossings, junctions, draw-bridges and tunnels:

Electric Semaphore with Repeater.

The accompanying illustrations will serve to explain our improved system of Electric Sema-phores and Repeaters.

The external appearance of the Sema-phore, in its usual construction, is shown in the front elevation (Fig. 1) and the side elevation (Fig. 2). It is placed on a post at the right hand side



Fig. 1.



Fig. 2.

of the track, at a suitable height above the ground; the signal being exhibited through two openings, usually about twelve inches in diameter, covered with glass, and illuminated at night by a lamp fitted with a reflector at the back of the signal box. The interior mechanism of the Sema-phore is shown in Fig. 3.

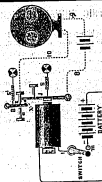
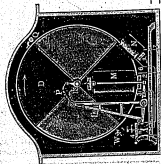


Fig. 3.



D is a disk about thirty inches in diameter, divided into four segments, alternately white and red. An adjustable counter-balance weight, W_1 , attached to the periphery of the disk, keeps it in the proper position to show white, indicating safety, except when under the influence of the electric current; or it may be arranged to show red by the action of gravity, in which case a signal can only be shown when the undulatory and battery are in perfect working order.

The disk is made to turn through one fourth of a revolution by means of an electro-magnet, M_1 , the armature, A_1 , which is attached to the short arm of the angular lever, L_1 , having a fulcrum at I_1 . The long arm of this lever is connected by the pinion P with the gear K_1 on the axle of the signal disk. Thus the disk will turn and show a red signal whenever the magnet M_1 is changed by the electric current. N is a supplementary magnet, for locking the signal in position when set red, as hereinafter explained.

The apparatus at the station may be at any required distance from the Semaphore. It consists of a secondary or station signal—which, in principle and external appearance, is a miniature copy of the distant Semaphore—a differential relay and a signal switch, for operating the Semaphore, as represented in figures 3 and 4. The battery for working this entire apparatus



Fig. 4.

is also placed at the station.

The operation of the apparatus is as follows: If it is desired to set the distant Semaphore red, the signal switch is turned on

the stud as (see figure 3); a circuit is then formed, from the main battery through the switch, wire 1, magnet R of the differential relay, wire 2, Semaphore magnet M_1 , wire 3, circuit changer 4, and wire 5. The magnet R attracts its armature strongly, bringing the lever J into contact with B_1 , and then forcing the latter against the stop C_1 , so that the local circuit which operates the small signal is broken at x_1 , notwithstanding it was at the same instant closed at x .

At the same time the magnet M_1 turns the semaphore disk D in the direction shown by the arrow. Just before the disk D completes its movement, and after the red signal has been fully exhibited, a projection at o_1 on the lever L_1 comes in contact with a corresponding projection on the circuit changer 4, and lifts it up, breaking the previously existing electrical contact at N_1 , which cuts the battery current off from the magnet M_1 , and instantly transfers it to the locking magnet N . This occurs just as the soft iron armature Q on the disk comes in contact with N_1 and the latter, being now strongly magnetized, seizes Q with great force, and locks the signal disk firmly in its new position. The magnet N is, however, wound with a much finer wire than M_1 , and the insertion of this great amount of extra resistance in the circuit weakens it to less than half its original strength in the relay R . When this occurs the spring s_1 , which is adjusted with a strong tension, pulls the lever J away from the relay magnet until it is itself attracted by the stop x . At this juncture the local circuit is completed through wires 6, 9 and 10, and levers B and J , and the station signal turns to white, also, repeating the movement of the semaphore.

A careful study of the arrangement will show that it is no possible error on the distant signal change, before the distant semaphore has previously changed. The accurate repetition of the distant signal is rendered absolutely certain.

To work one of these signals at a distance of a mile requires but ten or twelve cups of battery, and the expense of battery material does not exceed

FIVE DOLLARS PER ANNUM.

This is the most effective and generally useful signal ever introduced. Its applications are almost innumerable. We have only space to refer to a few of the most important ones:

FOR DESPATCHING TRAINS.

The Philadelphia and Erie Railroad has, for several months, employed these semaphores for controlling the movements of trains over a single track between Salisbury and Northumberland, Pa., dispensing altogether with the written telegraphic train orders formerly used. An important saving of time is thus effected, as the dispatcher, on being notified by an electric bell that a train is ready to start from the other station, merely gives the engineer a white signal on the Semaphore, and the train moves forward at once. Under the ordinary system two or three minutes would be consumed in transmitting and repeating the telegraphic order, and in getting the signatures of the conductor and engineer. Where the number of trains is very great, this is often an important consideration.

FOR STATION YARDS AND JUNCTIONS.

The most complicated arrangement of switches may be provided with self-operating signals, so that the movement of any one, or any number of switches will exhibit a danger signal at every point required to be guarded, and a safety signal at every other point, the whole being so arranged that no safety signal whatever can be exhibited in case of the apparatus failing to operate. The position of every signal, and consequently of every switch, may be indicated at any required place. This arrangement is especially valuable at junctions of two or more double track roads.

FOR GRADE CROSSINGS.

The two sets of signals are arranged to work from the same battery, which can therefore be put in connection with but one pair of signals at a time, rendering it utterly impossible to show a safety signal on both roads at once. If, then, the signals are properly observed, no possible carelessness or negligence can involve trains in a collision.

FOR WAY STATIONS AND CURVES.

There are many places where it is an almost daily necessity to send a man out a long distance from a station to flag exposed trains. In such places a permanent signal of this kind not only saves much time and trouble, but also conduces to the safety of trains.

There are special applications of this signal almost too numerous to mention, which will readily suggest themselves to the experienced railroad superintendent. We employ experienced engineers and electricians, who will design special arrangements to meet any required conditions, upon application to the Company.

THE AUTOMATIC BLOCK-SIGNAL.

After years of labor and experiment, we are at length prepared to offer a satisfactory Automatic Block Signal, based upon the Poiré patent of 1875, which covers the use of the track itself as an electrical conductor for operating Semaphore signals. Having thoroughly tested this system in practical use, we are now prepared to supply estimates for its introduction in any part of the United States or British Provinces, and to guarantee it to give entire satisfaction. This system is designed more especially for double track roads, and automatically prevents trains following each other on the same track—from approaching within a stated distance of each other.

20 In case a train breaks in two, and a portion of it is thereby left standing on the line, the signal will indicate the fact to the following train. No other system is capable of doing this.

This system, either alone or in combination with the repeating Semaphore, is especially valuable for tunnels and single track bridges.

ARE ELECTRIC SIGNALS RELIABLE?

Undone prejudice has hitherto existed against electric signals among railroad men, in consequence of their liability to get out of order unless kept under the constant supervision of a skilled electrician. This difficulty has been in some cases partly owing to the unskillful construction of the signal machinery, but in a far greater degree from the lack of a suitable battery adapted to this service. It is only within the last two or three years that any battery has been available for such purposes, capable of maintaining a constant and absolutely uniform electric current for months at a time, without any attention whatever.

THE EASTERN METALLIC BATTERY.

has been found to be peculiarly well adapted for this service, and is now usually employed in working the signal. It is shown in perspective in fig. 5, and in section in fig. 6. It consists

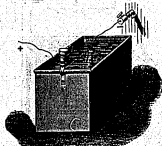
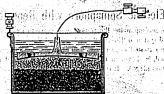


Fig. 5.

merely of a containing vessel of sheet lead, in which is placed five or six pounds of sulphate of copper. This is covered with



a layer of common sand, on which the zinc plate rests. This vessel is then nearly filled with a solution of sulphate of zinc. This battery is so extremely simple in construction and arrangement that the most unskilled laborer can readily be taught to manage it, while it will remain in action and give a strong and perfectly uniform current from three months to a year (according to the work done by it), without any attention whatever. The signal machinery itself, as may readily be understood from the description, is very simple, and can readily be comprehended and managed by any telegraphic operator.

We manufacture our own **MACHINERY** and **APPARATUS**, and for this reason its strength, durability and adaptation to the service to be performed are unequalled. All the mechanisms, especially that intended for station purposes, is of tasteful design and excellent finish.

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Small Business

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Chemical Paper for Telegraphing

79

Solution, Few Mark

Remark C.

1. Sulphocyanide Pot. } Thin Slate No mark at first but comes out
Bichloride Merc. } strong after

2. Logwood }
Sulphocyanide Pot. } Thin Purple.
Chloride Sodium }

3. Chloride Sodium }
Alcohol } Thinnest Purple.
Logwood }

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Log - Chl So. gives with Stannous styes a mark with
 1 cup battery through 20 000 ohm - larger than
 Reg ferrid -

Log Nitrate Ammon. Tin pen not delicate as Iron - dolt
 Chl Calcium - in both cases more delicate
 than ferrid -

Log - Chl Zinc best with stannous pen



Laboratory Notebook, Cat. 1175

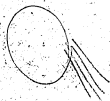
This notebook covers the period November 1873 - July 1874. The laboratory notes and drawings are by Edison and Charles Batchelor. They deal primarily with automatic, printing, and chemical telegraphy; batteries; and general electrical experiments. There are also notes on the electromagnet. At the beginning of the book is a list of hours worked by the employees of the firm of Edison & Unger, probably for 1871. The front cover is labeled "Volume 7." On many of the pages there are faint page/volume numbers similar to those used in Unbound Notebooks, volumes 8-18. The book contains 219 numbered pages.

Missing pages: 1-80.

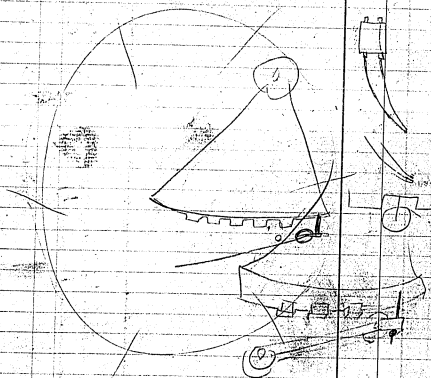
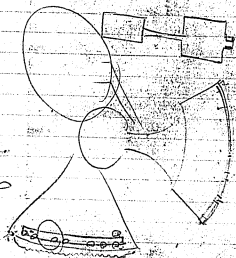
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81



Positive & Negative electricity. -

If a glass tube, being not dried, is quickly rubbed with a dry woollen cloth, the following facts may be produced.


The tube being furnished a certain light induction, such as feathers, metallic rods, bits of light paper, &c. will be attracted to it, & will adhere to them.

If the section tube placed in the dark, a faint light will be seen, & films of moisture on the cloth.

If the glass be connected to a metallic rod, or to the knuckle of the finger, a luminous spark accompanied by a hiss, and even sound, will pass between the same & the finger.

On removing the glass from the elbow, a sensation will be produced like that which is felt when we touch a wire.


The same facts will be produced by the cloth, with which the glass is rubbed, as in the glass itself.

Fig. 1.  A glass tube A, supported by a stand B, with a wire C connected to it. The wire C is connected to the end of the tube A, and the other end of the wire C is connected to the ground.

If the glass tube B, after being rubbed, be brought in contact successively with a silk, with thin suspended, & then glass, from them a spark will be emitted in the dark, in contact of which there will be a light by the glass tube, when it is brought near them. & they will in the darkness, give out small sparks when brought into contact.

If the hand which holds the cloth, & covered with a dry silk glove, be cloth after the section, with the glass, will exhibit the same effects. If it be done, it will be evident with the facts of the section, from them, it will also them, & the facts themselves, will be the same.

It appears, therefore, that by the action of electricity, the same facts are produced on the cloth & the glass.

Fig. 2.  A glass tube A, supported by a stand B, with a wire C connected to it. A second glass tube D is connected to the wire C, and the other end of the wire D is connected to the ground.

If after section, the glass be brought into contact with one side of the wire, & the cloth with the other, it will be observed, the glass when furnished to the cloth

It will attract it. The cloth presents to the ball 2nd more attract it. 3rd the ball will attract said cloth. It follows therefore that the electricity developed by friction in the cloth differs from that on the glass, inasmuch as instead of being characterized by repulsion it is in some degree mutually attractive.

The supposition that electrical fluids are due to a peculiar substance has taken the form of the electric form. Some philosophers, however, like B. Franklin, have supposed (a) that there is only a single electric fluid, the particles of which mutually repel each other, but attract those of material bodies; (b) that this fluid is present in a less or all bodies in their natural state; (c) that when any body contains either more or less than its natural charge of electric fluid, the excess or deficiency causes the body to possess various properties which are collectively referred to, among others, electricity.

On this view, it is supposed that when a piece of glass is rubbed with a woollen cloth, the cloth loses out of its natural charge of electricity; & that because electricity is negative, or by deficiency, while the electricity which the cloth has is accumulated on the glass, which therefore becomes electrified positively or by excess.

The silk ball B. (p. 1) brought by the glass, receives the positive fluid from it, & the silk ball C. repelled by the cloth, because the negative fluid from it.

Since the contrary electricities are mutually attracted, the ball B. & C. in the same attract each other, & since the electricities are mutually repulsive, the glass will repel the ball B. & the cloth will attract the ball C.

If all known substances could be in the most perfect state of positive & negative given either of negative. Between these extreme substances others might be so arranged that any substance in the world being rubbed upon long time that which holds the negative place

would be positively & that which holds the lower negative electrified. One list is as follows.

1. Gun flat	6. Glass	11. Salting straw
2. Flannel	7. Cotton	12. Cork
3. Ivory	8. White silk	13. Sulphur
4. Black Opal	9. The dry hand	14. Carthage
5. Wool	10. Horn	15. Gun cotton

2. Method of producing electricity by glass & silk with amalgam.

Experience has proved that the most apparent means of developing electricity in great quantity & intensity is by the friction of glass upon a surface of silk or cotton smeared with an amalgam composed of tin (1) & zinc (2) & mercury (3) mixed with some unctuous matter. At some fine chalk be sprinkled on the surface of a wooden cup, into which the mercury should be poured hot.

Let the piece of tin melted together be then poured in, & the tin being dried & well shaken, the amalgam may be allowed to cool. It is then finely pulverized in a mortar, & being mixed with unctuous matter may be applied to the surface.

3. Degrees of Conductors.

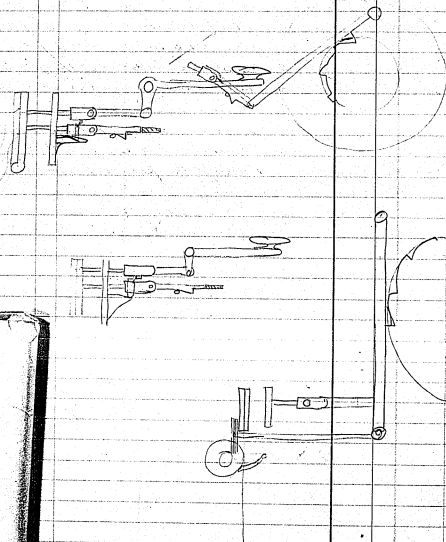
Of all bodies the most perfect conductors are the metals. Less bodies transmit electricity instantaneously, without any sensible obstruction, provided these substances are not too small, in relation to the quantity of electricity imparted to them.

The bodies named in the following series pass the conducting & nonconducting property to a greater or less degree.

Conductors	Non conductors
1. Gold	1. Gum lac
2. Silver	2. Amber
3. Platinum	3. Resin

Automatic

Device for Manufacturing
 Transmissions for Automatic
 Transmissions for Stock Exchanges



Automatic

The strip of paper for Transmissions must be perforated by 2 punches one for printing lines & the other for escapement & as the work work on open & closed circuit the ^{paper} must be perforated after the manner by the Transmitter:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z .

now if this strip is put on a drum & a roller pen running over it & connected with the escapement of a stock printer it will work the type wheel around but down in order to print you have to have a separate punch which punches a hole directly above in directly between of on the drum the other & which will another roller pen in Transmissions connected with the type wheel of stock as if you want to print BAD your perforated strip will look like this:

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Nov 1873

Experiment

1 See what effect a strong magnet has on
copper. Nickel

13

2 Make 2 magnetic needles thus:-

13

or suspend one with a thread
& see what effect the other has on it.

3 Take a magnetic needle & place it on a cork in
a dish of water see if it points north.

13

Now put a current from a strong battery on it
& see what effect

4 Find out what this means "Magnetic attraction"

13

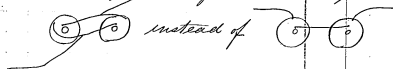
& repulsions are inversely as the square of the distance.

5 See whether the poles of a gravity battery give off
hydrogen & oxygen or not

13

6 See how much resistance is lost in
connecting a magnet this way:

13

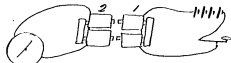


A current of electricity passing near a
magnetic needle deflects it.

H.C.

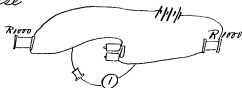
Induction

- 7 See how much induction there is from a magnet of a given size on another the same size when they are touching & different distances away.

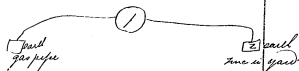


- 8 Shunt No 1 Magnet
 " No 2 "
 " both " & note induction

- 9 Examine with the back charge in this case



- 10 Connect a wire to line ground in yard & 1 & gas pipe & see if you get a current this



- 11 Decompose bricks of Potassium with electricity

- 11 5 cups Carbon
 Hydrogen bubbles from Neg. pole
 Oxygen combines with H₂O & the solution is red
 free settling & bottom in deep cloudy state colour
 of Iron oxides.

Cuv

12. Chemical paper.
Hydrosulphuric Acid } Iron pen
Gyannet of Pot.
13. Formed Sol.
Hydrosulphuric Acid } Iron pen
14. Formed Sol.
Hydrosulphat of Ammonia } Iron pen
15. Antimoniate Potash } Iron pen.
Chloride Sodium
16. Antimoniate Pot.
Chloride Sodium } Iron pen
1 drop Hydro Sulph Acid
17. Get resistance of Iodine paper moved
3" a second to prevent Iodine from in-
filtrating the pen. See if resistance decreases
as battery increases.
18. Make little solution & try it
12 Water
4 Sol. Chl. Cal.
2 Sol Sol. Ferrosulphate Pot.
add Chromic acid till it assumes
a cherry color.
Add to part Chl. Sodium

Cuv

White paper. deep black smalt but fades out
not as sensitive as pen

Very light yellow paper. purple smalt very
weak permanent.

White paper. Black smalt turns brown
permanent

White paper Brown smalt pen.

E.H.B.

White paper Brown smalt

Little solution is a failure. The worst we have
ever thought of & got a smalt form is better than it
is smalt as good as smalt almost without battery as
well. It is a light yellow paper & blue smalt
with brown pen but pen will not smalt on
platinum plate & no other pen will smalt on
this solution. I can make do smalt smalt
with my finger nail as I can with pen.
And it is not success of everything but it is
a complete failure.

Amy

20

B



See if by any arrangement you can
prevent the needle of the shortwave Galv.
from sticking to the points, perhaps wetting
the wire, plus, which the
needle is suspended on will
do it

26

B

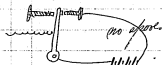
Oxymer & Permanganic Acid part with
Mer. O. with smallest current. It is a queer
object with sensitive paper to get the
largest amount of O liberated from the
plaster currents as to get the most
peroxide, therefore try Chlorine & Permanganic
acid with & without Chloride Sodium or
other substances. If it should spontaneously
decompose without current a little,
but make with, there would be a light
continuous spark between dots &
clashes but if you use just (200 words,
with good paper the spontaneously make
plate would not show.

Resistance

27. See if you can arrange inkling pad
so that the embossed marks on Morse
Register

28. Try conductivity of Mercury & zinc
amalgam in shall hole tube see if
it is high & constant

29. Try this: - See if the mere passage of
the current from 2 or 3
good cells to mass of carbon
that should be saturated
lower & plat. pt. will
make them stick. I suspect that when
the spring is adjusted so as to just pull
the lead away from point when no
current is on by pushing it up with
finger it won't stick but if battery is
connected & it is then pushed up it will stick
turning & magnetic effect of current
on plat. pt. Includes a rounder in
circuit



29. The stick is very perceptible on
4 cups carbon plate relay, 12 ohm resistance, sticking note
great when you substitute resistance for switches.
Platinum is magnetic I tested it by the
means I suspended a needle of soft iron by it
file of alk. for the points & every time I closed
circuit it drew needle & platinum points



Note. Platinum is not magnetic it is the current
which passes through it -

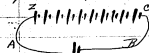
Amperes

- 30 You know that when Lycopodium Pt. is used with an iron pen, the pen becomes polarized thus: — — — — — On closing the circuit. — — — — — current there is an intense black mark on opening it closes on closing again the mark does not commence for some time. Is get rid of this by a double pen over 4 Platina also by copper, etc. You will soon



- 31 Put up 10 good Carbons & test each one on No 14. Should be to get deflection, put out best one & try 4 get 9 others that equal it. Then connect these 10 to a single cup, giving the same deflection, connecting the wire of 10 cup battery to the wire of 1 cup. & wire of 1 cup to wire of 1 cup. Take the deflection on 1.23 & 4 of 10 separate & the 1 separate every few hours for 3 days. Keeping them on closed circuit all time also take deflection all together. I want to see what behavior will take place on single cell

- 31 Galvan 24. Chloroporus 14. Reservoir. 4% fluidity each



Amount of Resistance of

Date	10 Cops		1 Cops		2 Cops		3 Cops		4 Cops		5 Cops		6 Cops		7 Cops		8 Cops		9 Cops		10 Cops		11 Cops		12 Cops		13 Cops		14 Cops		15 Cops		16 Cops		17 Cops		18 Cops		19 Cops		20 Cops		21 Cops		22 Cops		23 Cops		24 Cops		25 Cops		26 Cops		27 Cops		28 Cops		29 Cops		30 Cops		31 Cops		32 Cops		33 Cops		34 Cops		35 Cops		36 Cops		37 Cops		38 Cops		39 Cops		40 Cops		41 Cops		42 Cops		43 Cops		44 Cops		45 Cops		46 Cops		47 Cops		48 Cops		49 Cops		50 Cops		51 Cops		52 Cops		53 Cops		54 Cops		55 Cops		56 Cops		57 Cops		58 Cops		59 Cops		60 Cops		61 Cops		62 Cops		63 Cops		64 Cops		65 Cops		66 Cops		67 Cops		68 Cops		69 Cops		70 Cops		71 Cops		72 Cops		73 Cops		74 Cops		75 Cops		76 Cops		77 Cops		78 Cops		79 Cops		80 Cops		81 Cops		82 Cops		83 Cops		84 Cops		85 Cops		86 Cops		87 Cops		88 Cops		89 Cops		90 Cops		91 Cops		92 Cops		93 Cops		94 Cops		95 Cops		96 Cops		97 Cops		98 Cops		99 Cops		100 Cops		101 Cops		102 Cops		103 Cops		104 Cops		105 Cops		106 Cops		107 Cops		108 Cops		109 Cops		110 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Cops		811 Cops		812 Cops		813 Cops		814 Cops		815 Cops		816 Cops		817 Cops		818 Cops		819 Cops		820 Cops		821 Cops		822 Cops		823 Cops		824 Cops		825 Cops		826 Cops		827 Cops		828 Cops		829 Cops		830 Cops		831 Cops		832 Cops		833 Cops		834 Cops		835 Cops		836 Cops		837 Cops		838 Cops		839 Cops		840 Cops		841 Cops		842 Cops		843 Cops		844 Cops		845 Cops		846 Cops		847 Cops		848 Cops		849 Cops		850 Cops		851 Cops		852 Cops		853 Cops		854 Cops		855 Cops		856 Cops		857 Cops		858 Cops		859 Cops		860 Cops		861 Cops		862 Cops		863 Cops		864 Cops		865 Cops		866 Cops		867 Cops		868 Cops		869 Cops		870 Cops		871 Cops		872 Cops		873 Cops		874 Cops		875 Cops		876 Cops		877 Cops		878 Cops		879 Cops		880 Cops		881 Cops		882 Cops		883 Cops		884 Cops		885 Cops		886 Cops		887 Cops		888 Cops		889 Cops		890 Cops		891 Cops		892 Cops		893 Cops		894 Cops		895 Cops		896 Cops		897 Cops		898 Cops		899 Cops		900 Cops		901 Cops		902 Cops		903 Cops		904 Cops		905 Cops		906 Cops		907 Cops		908 Cops		909 Cops		910 Cops		911 Cops		912 Cops		913 Cops		914 Cops		915 Cops		916 Cops		917 Cops		918 Cops		919 Cops		920 Cops		921 Cops		922 Cops		923 Cops		924 Cops		925 Cops		926 Cops		927 Cops		928 Cops		929 Cops		930 Cops		931 Cops		932 Cops		933 Cops		934 Cops		935 Cops		936 Cops		937 Cops		938 Cops		939 Cops		940 Cops		941 Cops		942 Cops		943 Cops		944 Cops		945 Cops		946 Cops		947 Cops		948 Cops		949 Cops		950 Cops		951 Cops		952 Cops		953 Cops		954 Cops		955 Cops		956 Cops		957 Cops		958 Cops		959 Cops	
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32

Connect 5 cups Gibson with 5 more
opposing each other (10) the carbon of 1
wire connected with the carbon of the
other five. Take deflection of each
to separate then connect together &
take deflection if there is any current
see which battery gives it then change
cups so as to get a balance with 1 to 2
degrees on No 4

33

Put 3 good cups all same deflection
on No 4 separately on closed circuit
take deflection on all coils
every few hours add to
know how long a Carbon
battery will last on short
circuit

34

Evaporate different metal solutions on
zinc line (polished) by heat & note
any specific colors for different metals

fluid of Carbon 36° measured on each
Galvanometer 27. Line always rough. Best of all
Jan 1-9 am of Carbon works as good
Remarks: - 1 as given, rather polished a little

Date		1		2		3		4		5		6		7		8		9		10		11		12	
Jan 1	9 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	10 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	11 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	12 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	1 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	2 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	3 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	4 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	5 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	6 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	7 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	8 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	9 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	10 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	11 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	12 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

In taking both batteries together I get
a deflection of 5 degrees in favor of
No 1 but a little more deflection
Jan 2 - 7 pm In taking both batteries
get deflection of 10°. but if same device
to 10° in 20 minutes
Jan 2 - 8 pm Deflection of both 4.5° but same
device deflection
Jan 2 - 9 pm Deflection of 8.5° in 20 minutes
+ 10° per deflection but same device deflection

Butcher's
Kitchen

Galvanometer 28.

Remarks: Water solution works and passes

Date		1		2		3		4		5		6		7		8		9		10		11		12	
Jan 1	9 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	10 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	11 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	12 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	1 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	2 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	3 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	4 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	5 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	6 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	7 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	8 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	9 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	10 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	11 pm	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Jan 1	12 am	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

Cal. for finding out better how to use water outside
the water which just covered zinc to show
how much water is used

Butcher's
Kitchen

28

Induction:

See if the extension of the coil by
pulling 2 inches down core
fixing up against those
of magnet will increase
induction with out adding
more wire



Also try this

1st 2nd



You can gear up those tables so that
transmitter will have to run quite fast
to get a moderate speed on receiving
the speed must be even. in changing my
form one experiment to another I would
be best to keep transmitter going &
the pressure of your pen should always
be alike. probably this would answer

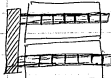
Don't
forget

For the experiment, use
a whole clock of paper
at once so as to have
the paper all alike etc
note the deflection of bar
used on No 4 coil & always keep up to
that deflection. Be sure you get full deflection
every time so not the least current appears on
paper even on turning slow. It takes
a given amount of resistance to show
current on each pen after you can
see it on first pen

Pull out solid core & insert core of
6 solid wires with regular back & estimate
in which gives most induction solid
in 6 wires

Edison
Patehela
Lyon } Jan 12 1874
14th

36 try this for induction & strength of attraction:



37

Core to be sawed in length of 2 in & separated by brass as the two parts touch but are too far apart to have an idea that there will be no induction & attraction through it as great as solid core in just as some better with some better. If this is so we can make long ordinary magnet thereby getting strength right have no induction.

38

Wind one layer of German silver wire on a core of boxwood covered with one layer of soft paper. Wind until good tension. After winding shellac & dry & then test resistance.

39

Test wire before winding it. German silver wire is made each turn sink into the paper & away from its neighbor.

40

Make solution of $\frac{1}{4}$ g. Ferripyanide Pot & $\frac{1}{4}$ g. salt. Crystallize & see what difference.

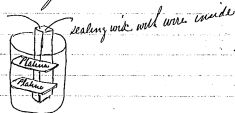
The solution crystallizes at first in beautiful long, clear crystals but on becoming dry & after more to the nature of salt & is of a greenish yellow hue.

99

by diffusion of different substances between 2 platinum disks. In ascertaining it, first place the solutions on glasses of the same sort so platinum disks shall fit each. allow them to stand in a quiet place for 24 hr. & note diffusion. The liquid (used by hydrometers) must be put in first, & the heavier is poured into bottom of glass with glass tube very carefully, to prevent mechanical diffusion. & must be then made where the liquids join & a note made as to the sharpness of line etc. the glass is then covered with a piece of writing paper on which has been rubbed kerosene & pushed down on the paper this will prevent evaporation.

At the end of 24 hours the substance which shows considerable diffusion is taken down & platinum disk placed on it so that the lower disk shall just cover it & mark previously made on the glass. This is connected to the battery, the lower to the zinc plate & the upper to copper plate. Set aside & note the time it takes to bring back the two liquids to their original position & note all phenomena.

White platinum disks like this:-



Sols - Molasses & Chromic Acid
 " & Chromic Yellow
 " & Prussian Blue

(Alcohol col. by Saffron &
 Deep yellow saturated sol. of sulphate Zinc)

Sulphate Copper & Chl. Sodium col. by addition.
 Hydro sulphide. How & Carb. Sol. col.
 Water & Lamp. Black.
 Glycerine & Turpentine
 Also immersed in 2 dense precipitates
 Reverse connections.

40 Arrange a test tube with 2 platinum strips
 & connect it to battery & test all metals in
 table 1 on 130 page under electric influence
 & ascertain if the reactions are the same
 & also use very dilute solutions of metals to
 be detected. & as the strength of the
 electric current increases the delicacy also
 pass a spark constantly into the solution
 from the plate glass machine.

41. Substitute a magnesium plate in battery in place of zinc & note deflections.

42. When magnesium is put in water it liberates pure monatomic hydrogen.

43. Associate a Wheatstone's pen with the zinc pen in reg. stand for first before & then after the new one & note the difference.

44. Also a thick solution of glue with Lignite of Soda & Hydrochloric Acid is composed of Lignitic Acid & Glue is precipitated. At a temperature of 84° & 114° Fahr. it is sufficiently elastic to admit of being drawn into long thin sheets or cooling it becomes solid & brittle & on being heated is again soft & plastic. See if it works as for the rubber.

45. Try this for a more sensitive animal galvan. By this means we can get a great deal longer wire.



Ammonium x Battery

45 Make Automatic Glue for Automatic

46 Make battery of sulphate of soda instead of potassium & take deflections

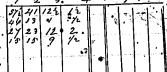
47 Make a battery with plumbago & porous cup & measure of ammonia in jar & take deflections

Ammonium x Battery

45 18 fluid of water } appears in water bath.
 10 g. gum arabic } this is about enough for
 7 g. sugar } 10 pots. I use about 6 g. per pot.
 to make 10 g.

4 fluid of water - 7 g. of sulphate of soda
 & 1 carbon cup.

Aug - 20 PM
 11 - 10 PM
 11 - 10 PM
 11 - 10 PM

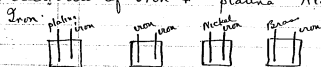


used 10 m. carbon cell (No 20) think it should be
 used in porous cup.



X is a trough water tight made so by paraffine in this trough is set 5 zincs with porous cups and 5 carbons, in the porous cells is the Rich Ordinary fluid in the trough is acidulated water. Take the deflections of these 5 cups through 5000 ohms, then take 5 regular cups and take the deflection through same. Revis with Bradley No. 1. The object being to ascertain if the separation of each element in separate outside solutions is absolutely necessary - Try on No. 1 2 3 4 4. Bodley

Cups in which the ferrocyanide Regular solution is placed. in three cups are plunged small electrodes of Iron + platinum Nickel Brass +



Connect to Gal No 1 2 3 & 4 get deflections on each cup, have all platis as near same size and distance apart as possible. If no deflection on Bradley try Mirror. The object being to ascertain if the Iron recording pen in conjunction with the wet paper and drum of Nickel or other metal forms a cell and generate a current. If it does it may have sufficient electromotive force to neutralize a very feeble current which is sometimes used in Experimenting.

Get the deflection of 4 cups Calland used for local on Washa over through 5000 3000 1000 & 500 ohms. Then on No 1 2 3 & 4 Cals -

Then take 2 cups Carbon and 15k the deflection through same resistance and see if the 2 Carbon don't equal the Calland 4 cups. in the proportion of 100 units for Carbon 56. for Calland.

If 3 cups Carbon are necessary take new set deflections

Then try 1 Carbon Cup on No 1 2 3 4 4 Especially.

Then Connect the four Calland for quantity is all the Zincs together and all the Coppers together and take deflection on 1 2 3 4 same Galvanometer -

Select the Carbon Cup out of several as the one which gives the highest deflection on No. 4.

12/11/00

Jan 23 Bradley globe. 28 ^{then good light on}
^{2/10 thru station}
^{but not tested on}
~~2800~~ thru resistance ⁱⁿ

4 cups battery Wood box with 4 lines

	1	2	3	4		1	2	3	4
Jan 23	1	2	3	4		1	2	3	4
2 PM	51	5	2	0		23	6	1	0

Jan 24 51-5-1-0-12N 14 14 1 1/2

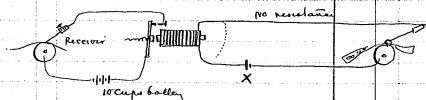
83-82-81-51 5 PM 89-88 86 63

Jan 25 83-81-81-51 10 AM 82 81 81 40

Analyze that red looking stuff that
gathers on Oakland battery.
Sauspriet Iron & Lead.

Also test some of our Zinc used for
batteries for the several Metals.

Ascertain the greatest number of perfect
dots that can be recorded on Chemical
paper from the repeating point of our
large relay tillation pattern. Then



See page 163.

Try with 1 Carbon Cell at X. Then 2. Then
4 - 8 - 16 - 32 -

The armature bring it from Core, Then
Repeat with it $\frac{1}{64}$ - then repeat with
it at $\frac{1}{8}$ then $\frac{1}{4}$ -

After these Experiments which should be
performed with a continuous line of dots
and accurate timing not less than
10 seconds. Shunt the relay with
twice its own Resistance, the relay
ought to be 200 ohms but 100 will
do. Then go all over it, be sure on making
the first trial to adjust the spring
a number of times before pronouncing that it
is the highest speed possible -
When you try this Experiment I want
to assist -

Then Substitute for Illation the Phelps
and add outside Resistance so as to
Equal the R of the former relay &
Duplicate all the Experiments.
Then try - One relay with short off
& Duplicate all the Experiments

Then Screw two Illation Spools together
like



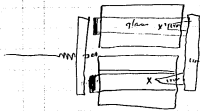
and use as a long relay and Duplicate
all Experiments,

Then try one of these little short relays
on brass base -

Then Try a Duplex Sounder in place of
relay

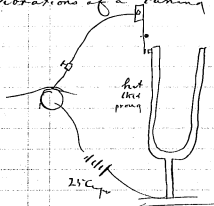
Get a pane of glass wipe perfectly dry and
paste two strips tin foil on each end
Connect one to each other to plate glass
Machine, use some highly colored
spray between the foils and pass
the current through notice if the particles
of spray separate from each other
also pass the 175 small cups through
a thin film of colored water is from foil
to foil see if it don't separate the machine
in two parts until no current passes

Make an electromagnet the Cons of
which are glass tubes filled & packed
tightly with fine Iron (no steel) filings
Use an Iron back & Iron armature
Close the front ends with sealing wax.
Try attractive force & Induction.



points X & fastened to back and extend
on among the filings to form a magnetic
connection.

In recording on chemical paper the
vibrations of a tuning fork this



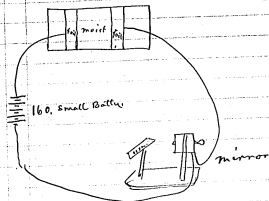
To insulate Copper wire for magnets by forming an insoluble oxide on it -

Try this. Immerse a loosely coiled hank of Copper in a jar containing air inverted over a pan of water into this under water turning oxygen gas by a tube for few seconds, (clean the Copper first). This will oxidize the Copper then quickly & carefully withdraw the Copper wire and immerse for an instant in a solution of ferrous ferrihydrate of pot. 10g to quart water. This will convert the oxide of Copper into the insoluble ferrihydrate of Copper and perhaps prevent oxidation & stick to the wire,

Take two brightly highly polished pieces 4 inch long of no. 9. wire, boil one for 1 hour in oil, do nothing with the other. Now put both in a bottle water separated from each other - leave the bottle open to allow free access of air & set up on high shelf - for several months. I think the oil will prevent one of the wires from rusting.

These two pieces of Iron wire were put in a battery jar the one that is next with a file on end was boiled in lard oil for 1 hour

Nov 31 2 pieces of Washburn wire nicely polished the one with 3 rings on end had been boiled in lard oil for 1 hour 2 shorter pieces of 9 wire with the galvanop. part filed off 1 with 1 mark on 4-1 with 2 marks on 1/2 the 1st with 2 marks has been boiled in oil



Mount glass between bulb & lake deflection
Even 3 minutes =

Ascertain what is resistance of some Body also
your own + Brown with dropping wet hands
See if the deflection is constant for 5 minutes.

Aluminum Pen.

Aluminum Salts have a great affinity
for Coloring Matter, forming insoluble pigments.

Perhaps a protoxide will be formed in the Electrolysis
then if the paper contains a floating color
from an organic substance or otherwise and
the Protoxide combines with it to form an
insoluble color while the color not
under Electrolysis fades.

Aluminum Salt have a great affinity
for Gelatin, perhaps a Gelatinizer

4 Cops Carbon
Jan 21. Low 19.870 ohms
Batel 16.900
Pentel 16.070

paper might be used and insoluble
 Marks (used) to ~~and~~ produce

Alum changes the Tint of blue papers
 of plants to green
 hence the paper be wet with a stable
 infusion of some Blue Color. (say red cabbage
 although that isn't Blue) or hogweed) on
 passing the current a proto would be
 formed & change the blue to Green &
 perhaps some Chemical having
 no action of the Vegetable Color
 could be included in the solution
 which Chemical would increase the
 Oxidation or perhaps produce a
 reducing action & turn the lower
 oxide into a higher or form an
 Alum or aluminum salt

Try for Patent purposes

Ferroprussiate. Chl Calcium & Sulphuric or
 Nitric Muriatic Acids to free the Chlorine
 from the Calcium & produce a ferrid

also - Ferroprussiate. Chl Lime & acids

" " " All Chlorides & acids named
 Chlorates also

prepare some Cochineal as given in Recipe -
 (test for color with iron) & add some Chloride &
 test for delicacy

Patent

Ferroprussiate. Chlorinated Lime & slight
 amount of Sulphuric Acid, or Nitric Acid.
 Hydrochloric Acid ^{Bluish-Green} Acetic Acid ^{Yellow}

Ferro-cyanide strong. Strong Sol Chl Calcium
 Little Chl. Ind - Sol acid until it turns
 paper yellow - Little turns it blue. Very
 sensitive. Probably greater than ferrid;
 Cases of Sulph. Ac. on good.

Nickel sulphate gives brown mark with excess
 ferrid & Chlodium nearly as good as Iron

Strong Sol Chl. Calcium & little Nitric Muriatic ^{light blue} ~~good mark~~

522. = $\frac{1}{2}$
 341. = $\frac{1}{4}$
 06. = $\frac{3}{4}$
 03.1 = 1

Paper

1 oz Diachmo Dilute Sulphuric Acid,
5 grains Permanganate Potash.
Will probably give white mark,

Paper

1 oz Sulphoda. 6 penny W Sul Acid
6 penny W Sul Copper Boil,
try - if unsatisfactory add a chloride
also to fresh part add nitrate Ammon

Try

little perchl Iron & Cyanide Potassium
to this add 30 different solutions the
Grand Acids.
The Sul Acid will probably free the
Chlorine from the perchloride Iron
The iron going over to the cyanide to
form ferrocyanide the Chlorine acting
with this forms a ferric acid obtain a
sensitive paper perhaps peroxide iron
or desguin or even Sul Iron will answer

Try Nitroprusside Sodium - & salt

Try Nitroprusside Sodium & Chl Sod &
Sul Acid, The NitroPruss having a
ferro in it Sul Acid action on Chl
Sod Calcium etc will produce a ferric

With this white mark not very permanent
obtained with nickel C₂H₄ Iron Bromide
pore probably will prep for paper good
Paper be obtained, paper colored intensely
summed also (ms) why bleaching by
Sul Iron - got no mark -

Cyanide Pot & Perchl Iron from Blue paper

Don't work - sticks good with peroxide only

Test starch with Tannin, etc as delicate
as Iodine - Dick No 4381

Poison Mushroom Solution - turns Oxide
gold yellow - also other metal characters
Colors sensitive.

Aluminum pen Colored paper
Borax & Aqua Ammonia White mark

(antidote of anti-well)

Luxuriant Acetic Acid. Blood.
Red Mark in Solution or dilute Blood
imperceptible

Lead pen - Sulphuric Lime 2 drops 2 drops
Tartaric Acid powder mix & shake in a stoppered
bottle, with pink water let settle pour off
Clear liquid & add $1\frac{1}{2}$ oz Tartaric acid
Black mark - if no mark add little more
Strong - 4402 Try 4403

Stomach from Logwood - Copper pen.
Chloride pink blue mark
Is a fresh part add Acetic Ac.

Solution of Sulph. Manganese
 Platinum green
 High tension Sol.
 Also Chemical Mac
 Ozone: gives black mass.

Hydrocyanic Ac Iron pen
 Sulphuric Ac

Cyanide of Potassium
 Sulphuric Ac
 Iron Pen.

Mix Gum Arabic 125 parts Concentrated
 Sulphate Alumina 5 parts.
 The proportion of Gum Arabic is 2 of Gum
 to 5 of water.
 The sulphate of Alumina is to be dissolved as
 10 times its weight water & mixed direct
 with gum solution.
 Called Vegetable glue.

E. A. M. 15th

Quacium test for ozone

Dr. Doty of N.Y. states that strips of paper
saturated with solution of quacium oxide
a more sensitive & reliable reagent to test
for presence of ozone than either K₂ or starch
in paper containing persulphate of potassium.
That fact an electrometer can be
relied on & shot at least 11 gradations
in shade.

Iodide of Potassium solution

Bromine pen shorts you brown mark
Palladium pen " " black mark
perhaps these are permanent &
persistent

See how many cups of battery it takes
to mark on coated paper why paper?

Waller Pongel-Wassermann's Solution

150 parts cup. Nitrate Ammonium

5 " Ferro Cyan Sol.

10 " Water

Before using, paper must be impregnated
with dilute Sulph. ac. paper being strong
for conduction but not to attack metal

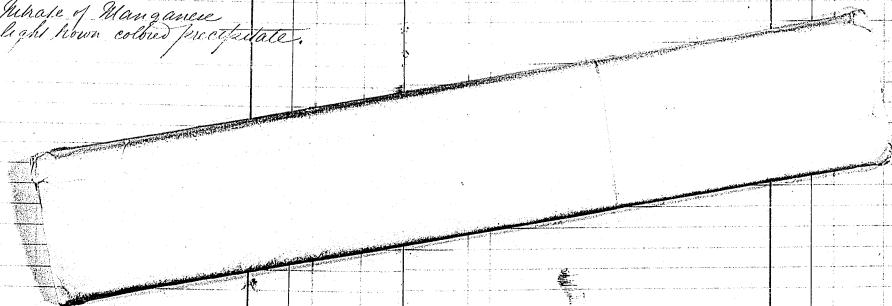
Guinicum dissolved by Aqua Ammonia. no waste.
 Dry Apoor mark with platinum only on platinum belt
 on iron — add salt, increases delicacy much
 gives blue mark with Copper which is at first
 white rapidly turns blue ^{on heat of} Iron gun on platinum
 Deep red or rust colored & on iron belt mark
 quite delicate something in it. paper first light
 color turn green mark spread slightly
 Coke to gun. Lime to pen no good.

The grooved wheel which Bergman
 claimed on Universal printer was
 in Burgess' Electric Magazine trial
 about (1848).



Walter Russell's Solution:

Whale of Manganese
 a light brown colored precipitate.



Paris — wires are run in Lead tubes & hung along the
 sewers. Some of tubes have only 3 wires. 6 to 8
 miles to get out of City.

Paris uses regular submarine Cable to town of St. Omer
 several wires each Cable, 6 miles out. Poles, —
 Gas arm wires etc nearly like American, porcelain

French Pole wires close as in England. — no cross
 arms.

French Poles & Relay, no Pans in.
 Closed Circuits used a little in Pans in.

Paris in Liberty to take Automobiles

Feb 5 1874

Manganese & Magnesium decompose water at the boiling point, but will not do it cold. (C) the affinity of O for H is greater when cold than for Manganese or Magnesium, but the affinity of O for H is lessened by heat & O for Mn & Mg correspondingly increased.

Other metals will decompose water at red heat lowest as Zinc then Iron Co Ni Sn Sp Al Pb Cu last Noble which show no tendency to oxidize in air are incapable of removing O from H & O hence magnesium & Manganese pens (then use hot rolls of req ferret)

A fine state of division favors chemical action hence Calland round Box Zinc or paper or gutter box filled with a Zinc & packed granulated Zinc & Copper box filled with Copper wire scraps. Get a porous pot about $\frac{1}{2}$ inch thick to fit $1\frac{1}{2}$ Carbon battery Zinc & 1 Carbon to try length time will last & to prevent the chemical diffusion of Bichromate from the Carbon pole where it is needed must to give up an atom of O to the H. set free, if Phosphorus exposed in a lump to air don't oxidize so quick but dissolve it in a little Bisulphide of Carbon pour on a paper instantly all oxidizes being in a state of fine division hence I don't believe our present form decomposing pen Iron with ferrod utilizes all the O. produced, owing to it being in one mass, hence make a pen 64 diameter composed of a large number of No 40 hard drawn wires,

Feb 5. 73.74

Get some peroxide of Hydrogen H_2O_2
 sold by Pharmacologic Chemical

See Blox. p. 84 - 85 -

Disolve ferrid in it in place of H_2O .

Ether & Essential Oil. will decant & distill
 & stand. Go for Quassum Blox exp.
 look at 87. Note = Blood.

Filter Logwood boiling water solution,
 through filter having powdered Charcoal.
 This will decolorize it. See if uncolored
 residue has Logwood properties.
 Bone Black is more powerful

Galvano means of preparing Barium
 Blox 308,
 Make Calcium

Cerium from Prulox similar to Fe
 forms Red Compound Blox 325 - 6,

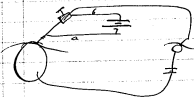
Sol of permang Pot is decant by a
 persons salt there red paper made
 white by proto Blox 360.

Good - Many like iron prulox
 immense coloring powers, many pen
 prulox many Chl Cal in
 paper form X body diff black

Feb 5 1874

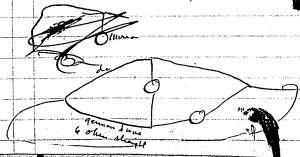
Percep. Blox 358.

Dark Sul Brim & Tanno A may be mixed
without color but on exposure to the
air the proto of Ch Sul is
decomposed & the carbon
comb forms blk percip hence mix
first - plat pen free above of O.
from pen requires oxidizes proto &
produces the effect =



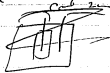
a circuit in which is powerful
quantity battery to heat iron
discompos. by the current
passing through it. This will increase
reaction, as chemical action are
powerfully increased by heat =

Try Induction from a Cores. Bundle
Spool of 500 or 600 ohms & then downward
to 1 ohm. in bridge with mirror

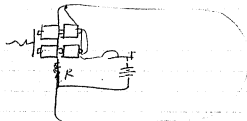


Feb 5 1874

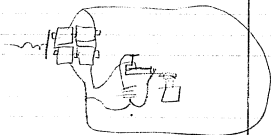
Try Carbon Cup on a second battery of
 clean zinc plate both same size. Giving
 no current try with Mercur also
 longest Gal ~~cell~~



New Duplex try it for book



also

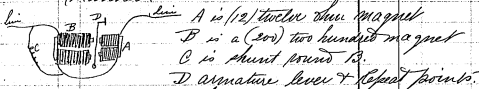


Open turn Black sulph lead into White
 Sulph lead.
 Black sulph lead, platinum for White mark

New Duplex all right O.K.

1874² See page 130

Bully Experiment by J. A. Gilman associated
by Chas. W. F. Gilman 12.10.74
Feb 9, 1875 Experiment tried on repeating at
high rates of speed by J. A. Gilman (Redgate & J)
Not being able to repeat more than
fifty (50) words per minute through an ordinary
relay we constructed one after the following
manner.



With away with spring.
When you close key the magnet A changes position
- Instantly, but counter-current from B prevents it from
changing instantaneously. When you open the
induction current from B works round the shunt C
& prevents the bad effects of B going on line.
The resistance in shunt C should be so regulated
that the armature will play on either side or
rather that when the line is kept closed the mag-
netism is equal on both sides.

With this relay we were enabled to repeat &
send on chemically prepared paper at the rate of
250 words per minute perfectly, if the armature
& repeater lever had been lighter we could
have no doubt have doubled the above amount
the connection of apparatus:-



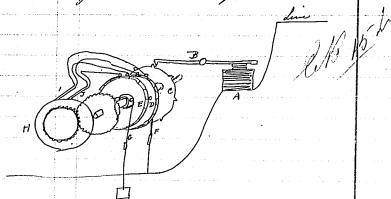
In our experiment the shunt E varied from
10 - 20 ohms

* The sentence we took was "Vine is the word of our discontent
made glorious summer by the sun of April & all the clouds that
lower upon" with this we got 250 words per minute
but counting others to a word we got 225.

We found that our rollers at A worked very quietly
 so much so that at that speed they would have to
 be cleaned every few thousand words, which is
 a defect which we must remedy

1. New Roman letter Telegraph Experiments by J. A. Edison assisted by Charles Batchelor.

Feb. 3, 1874. Having built a machine on the principle set forth by Edison for his extraordinary feat. He proceeded this night to test the machine.



Two New Roman Letter Chemical Telegraph

Feb 11, 1874 Experiment by J. A. Edison, assisted by Chas. McIntosh

In our last experiment with this subject we noticed that we could gain higher rate of speed if we could do away with such quick reversals of current. The present experiment is for that purpose and in this experiment we use reversals but they are of longer duration.

The inspirations must be made a little wider apart than the length of widest letter.

They the 3 & 4 pen must be set the width of the longest letter behind the others 1 & 2.

Thus:

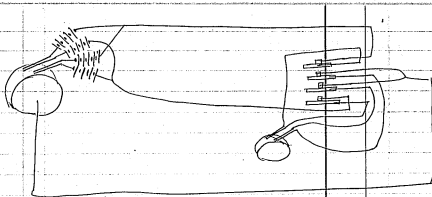


A wire be given the principle of the thing, is to send a positive current from

3 & 4 5 and 1 & 2 (Page 165) & record it on the 3 & 4 pen for receiving, & after they have got across the letter the pen ~~the~~ ~~the~~ 1 & 2 record their part of letter in same manner.

We can get better results at a higher rate of speed with this, but at present it is a synchronism, for if the paper medium is sent faster than the receiving, the writing will be late the the up half ahead of the bottom.

If of transmission is too slow it will be the other way, bottom line ahead of top. Very little practice however will enable a person to keep the letter always straight at the receiving end.



Feb 17. Make a secondary battery of one of the large blue vitreous battery jar & shell copper tin



2 parallel sheets of copper, ended together about 7/8 in. apart & may be separated with small pieces of wood about 3 inches & then securely bound together with stout mauling, so that the plates cannot possibly work loose with rough handling. I want to ascertain the amount of charge & discharge. This will show me a bridge as well as the length of discharge if satisfactory make for will be connecting the line I expect if these bats are placed in the line 30 miles apart that they will generate from the addition of the transmitted battery as much counter charge as the line & the line that being the case the static charge of the line will be exactly compensated for & any speed or any length of circuit may be obtained

Make a coil of that gutta serena wire (cable) with perfectly insulated joints & coil it on a magnet (i.e.) with large relay core so that it will take up the same bulk as if Bradley's coils were used & insert it in the liquid of a battery the current of which passes through the gutta serena wire

Also wind outside of a Michrowide battery jar with 5 or 6 layers of ordinary telegraph wire I wish to see if when I close the circuit of the battery there will be induction in the wire

Battery 1000
at 173.

Try this
Comparing the electromotor force of 2 elements.

2 elements are connected in same circuit with a Van. Galv., so that their currents go in same direction & so in contrary direction.

Electromotor force $E = \frac{E}{R} \frac{E'}{R'}$
The R of elements
Indefinite resistance
Intensities of sum & diff. is 1a

then

$$I_s = \frac{E + E'}{R + R' + r}$$

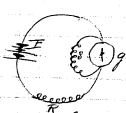
$$I_d = \frac{E - E'}{R + R' + r}$$

Whence $E' = E \cdot \frac{I_s - I_d}{I_s + I_d}$

By small condenser of alternate sheets of:—

Copper & tinfoil
Alfoil & zinc

To measure a large E.M.F. with a small one:— use a shunt.



Adding E units
This resistance of bat 1 & 2.
Find R of galvanometer
take deflection through
about 50 then

Insert battery 2 & change shunt
till needle deflects same degrees.

then the equal intensities in Galv. are

$$I_s = \frac{E}{(R+r)(1+\frac{r}{R})} + g$$

$$\frac{1}{2} I_s = \frac{E}{(R+r)(1+\frac{r}{R})} + g$$

from which

$$E' = E \cdot \frac{(R+r)(1+\frac{r}{R}) + g}{(R+r)(1+\frac{r}{R}) + g}$$

large battery E' compared with small
one E , shunt is only used in case of
the large one & g & r may be omitted.
in above by which

$$E' = E \cdot \frac{R+r+g}{(R+r)(1+\frac{r}{R}) + g}$$

By this

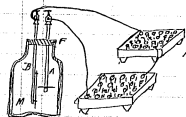


dry Electrostatic force v.
Type 151 page

Charge an insulated secondary battery box with the 8 Batter by connecting the prime conductor of electrical machine to one end of battery & other prime conductor to other end. Run for 5 minutes then with insulated key throw battery on an insulator thereby galvan.

Feb 22 1874

To determine whether any electricity pass from one pole of a battery of 100 elements to the other when separated a slight distance.

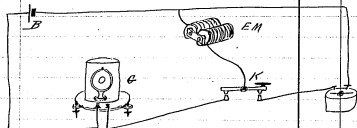


100 cells Franklin 1st battery

M is a clean dry Candy jar F is a tight fitting vulcanite & P rubber stop well secured in jar with plenty of sawdust so that not the slightest trace of air in or out. A & B are 2 brass rods B has 4 metallic projecting pins in which is secured a strip of chemical paper 2 inches long inserted

with K.I. & Harel (from March 20 of
distilled water & 0.5 g. of Pt.)
It is another job having a platinum wire
& facing the oxidized electrode coming
within exactly to 1/2 an inch from it.
These two rods project out of the bottle
& end in rounded tips. The tips should
be as far apart as possible. They are
connected with B. Ray. If the test battery
& placed on a table. The test of any
should be noticed & timed as well as
the time when the battery is first connected
the first tint should be noted & the time
taken when it shall have assumed a
depth equal to the first tint on the chromatic
scale shown in these work on B. Ray.
Should there be a tint it will prove
first that the particles of air are
conductors for dynamic or static
electricity of low tension & corollary
that induction is the effect of conduction
the fleeting effect being only produced
polarization (ie) an opposing E.M.F.
secondly that K.I. or any other
chemical compound that is decomposed
by electricity are very unsuitable for
B. Ray. etc.

Feb 21, 1874. Induction, motion or heat the present
 theme. Nearly.



B is a single Daniel cell

G is a thinner Galvanometer

K is a key with double contact points

E.M. is a long electro-magnet

G.B. is a Bradley Galvanometer in No 1 coil

Press key down & wait for 5 or 10 seconds

then open & close as quick as possible.

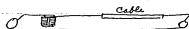
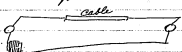
If the mirror don't move perceptibly & G.B.

does then smash goes through motion.

The magnet must be quite long & lots of
 fine wire on it otherwise with wire not be
 able to work the key quick enough to prevent
 the mirror working. The armature on E.M.
 should be permanently fixed so as to increase
 the induction effect.

Feb 22 1874

Note difference in these two.



first when magnet is placed between instrument
+ ground + then when it is placed between
instrument + cable.

Galvanometer test on Page 44

Electrical table & formulae.

M.H. has & thoroughly understood it

Feb 18, 1914 Cable.

Experiments on Edison's theory of secondary
battery action.

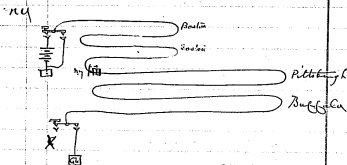
under the prevailing cond.
Distance of plate from Mirra gal. 22 inches
Resistance of Galv. 2100 ohms
" Shunt 113 ohms

Length of Cable
Battery 105 small cups.
Resistance of battery

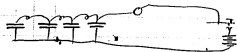
200 ohms
C.A.T. 12 1/2.

Cable

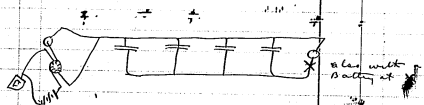
At Western Union.



See if Relay closes immediately - whether it
closes back with Key open at X to Earth or
insulated.



Stop see if there is enough indication to record
from my four Condensers



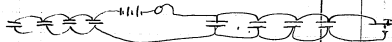
Put battery on to line & then throw off
Receiving instrument



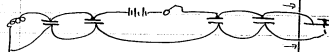
try what it records,
also with X Chk & Resistance



Remove Current on Cable but keep for some
instrument - portable that closing
instant but will make movable
record which would not if open



try

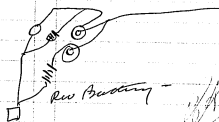
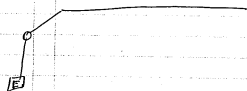
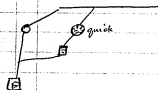


X

W

E

also replace magnet at X by
plain Resistance



Rev. Bunting

EXP. 10

Gaul Guaiac & Aqua Ammonia Water
 Chl Sodium ~~7000~~ ⁷⁰⁰⁰ am ^{in pot}
 Platinum pen blue - delicate
 Not very permanent

Gaul Guaiac - H₂O Aqua Ammonia
 Copper pen Blue - good
 Platinum pen fair blue

Gaul Guaiac. H₂O Chl Sodium Boiled
 Magnesium pen Black mark fair
 probably very delicate

Gaul Guaiac H₂O Ammonia W¹
 Fastest Copper & nickel Blue
 first class - platinum - better than
 Chl Sod - good but slightly
~~uneven~~ ^{uneven} ~~folks~~ - magnesium no
 good. Iron light Brown - no good

Gaul Guaiac H₂O Aqua Ammonia
 Chl ⁵⁰ & not fast together nickel best
 good - April 4 all above
 1874 - Elson

Edison Force.

1 L.K. Good. Lead pen - Iron base
 2 Ferricyanide Pot. = $1\frac{1}{4}$
 Sulphate Potash = 2.
 Sulphate Potash = 3
 Permanganate Potash = $3\frac{1}{4}$
 Acid Potassium Lactate = 3
 Rithall Potash = $3\frac{1}{2}$
 Bromide Potassium = $3\frac{1}{2}$
 Ferricyanide Potassium = $2\frac{1}{2}$
 Sulphate Iron = $\frac{1}{2}$
 Ammonia Citrate of Iron = $\frac{1}{2}$
 Sulphur Potash = $\frac{1}{2}$
 Sulphate of Manganese = $\frac{1}{4}$
 Sulphate of Soda = 3
 Boracic Acid = 1
 Salt. Chl. Sodium = $3\frac{1}{2}$
 Sulphuric Acid = 0
 Carboxylic Potash = $3\frac{1}{4}$
 Carboxylic Pot. + flour. = $2\frac{1}{2}$
 H O

Oct 13. 22 hr
 Apr 21 1894

Apr 21 Night. tried metals as to which was best for testing, saw from Platinum in Platinum lead on Platinum lead on Iron the base apparently is indifferent as to which metal is used. In testing with carbon & rubber we found that these ~~metals~~ ^{combinations} have very little friction at first when line was closed but soon it became very rough wheel quickly smoothed down as line opened. The reverse of this is the case when zinc is to platinum pad.

With 3 thicknesses of paper on drum it is of anything a little better.

tried Blue vitriol & Bichromate crystals. Glass & Hard rubber to make it go better by going through it but no go.

Heated metallic rubber no go.

Just got working, through 2 ordinary Water Rheostats 1 large ditto & 1 small ditto with 12 cups Carbon lat.

Minor gals. gave deflec $1\frac{1}{2}$ " above, same shunted with 200 ohms (read by ma)

200 ohm relay ceased to work when 1 of the potentials was cut about 1 mil.

Relay relay 126 ohms opened at about 24 out of 1 Rheostat.

Lined wet leather on drum (No good)
 " # Rubber & cloth "
 " Co Wood "
 " Indian rubber "
 " Phosphoric Ac. "
 " Acid "
 " Gt S paper & sheet ()
 " Dry paper "
 " Brown paper "
 " Brown cup "
 " Brown paper "

May 10 tests for sensitive solution for aluminum pen
 experiments on cable & of alumina
 (Orig. found solution poor taste greatly)
 Cyanide Pot. found to be pretty sensitive, as we
 tried & mixed with the following:
 Cyan Pot. Potate Manganese. No good.
 " Sugar No good.
 " Sol. Citrate Manganese pretty fair
 " " + salt good. X
 " Citric Acid. slight mark
 " Phospho Manganese Acid very good +
 " Chromic Acid No good.
 " Sol. Am. Sal. very good. X
 " Chromic Ac. slight mark.

May 14¹⁴ Separated lime seems to be the
 best solution, so far for cable. Aluminum pen
 Calling Hydrated Lime 180.
 " " & Chl. Sodium 110.
 " " Ammonia 120.
 " " Sugar 80.
 " " White of egg 90.
 " " Ammon. & Calc. Ammon. 120.
 " " sulphureted Pot & salt 50.
 " " Ammonia Cyan Pot & Chl. Soda } 125
 " " solution White or both sides }
 " " Soda Ammon. }
 " " Let P. 14/16.

May 16. Delicate solutions on Cable
 Cable & ~~Enders~~ &
 Table. Solids of Potassium at 100
 Sulphocyanide Sol. Salt }
 Hydrate Lime & Ammonia } 105

Decoction Logwood.

1/2 inch in each bottle. Table spoon of Chem.

Nitrate Potash O. St. and Nick. 10000 ch. scale very sensitive. Tin
 & Nick about equal. Fe not so much. comes out in air -
 with salt. Tin increases delicacy. Stick decreased -
 = Hydrogen. Platina "fin" tin - other inferior - salt in

Pyrogalllic Acid - Nickel on O. only.
 Sack. - mark all pen
 mark on H. tin slightly on O. best on H. Platina
 marks on H. Tellurium best. Plat on good as
 tin -

Citric Acid - None on H or O.
 Sack - None -

no good marks without battery -
 Chloride Mercury. Nickel good on O.
 Copper good on H.
 Sack Tin very sensitive purple

Acetate Lead - Not good -

Carbonate Pot - Not good - on H. Tin slips
 very easy when current on & hard when off
 may be good for chem ante friction
 Sack no good -

Benzene A. H. Platina with salt - O. Tin
 with salt fin. No good without salt.

"O"
 Sulphocyanide K. aluminum & Platina white
 not iron fades very sensitive. Iron pen
 blue mark form. Comes out in air -
 H. no good = salt. "O" about improving

Acetate Sodium.

O. In pen marks

H. "

Salt added

O & H In pen marks

Richromate of Potash.

O. In pen marks

H. " "

Salt ? " "

H. " "

Acid Potassium Iodide

O. Platina bleacher

O. Aluminium "

H. Iron

Salt: - H. Iron & Platina inferior mark

O. Platina bleacher

O. Aluminium bleacher

Sulphuret Potassium

O. In gold

H. Aluminium bleacher

Salt added. O. Copper very sensitive

it sticks to the paper

O. Iron more sensitive than copper

O. Nickel very sensitive but is black
as iron but not probably give better
results as iron appeared & probably a
little

O. Platina bleacher

H. Nothing

Ammonium Arsenate

O & H Nothing

Salt added

O & H Nothing

Iodide of PotassiumO. Platina good marks but fade
off on its ear like if generated

Salt added

O. Iron inferior

Copper. Marks when it has
got an oxide on only

H. Iron slightly

Potassium Ferrocyanide

H. Platina quite sensitive

H. Copper not quite so "

Like Copper Iron too not sensitive

O. Nothing

Salt added. Nothing

H. Platina quite delicate
all about sameSulphate of Mercury.

O. In gold no good

H. " "

Nitro Prusside soda
& and alkaline sulphideIntense purple color from
In pen mercurized gives occasional
metallic sheen

6 Sulphocyanide of Potassium
 O Plat blackens extremely sens.
 but fades out
 Aluminium blackens about same
 Iron Sensitive comes out black.
 Sulph. blackens
 H No good
 Salt added
 O Aluminium blackens very sens
 H No good

Potassium Sulphate
 O Lin. no mark
 Copper quite sens
 Nickel "
 H Platina extra sens.
 Lin. "
 Cadmium " better
 Aluminium + Lead + Copper good
 Silver + Iron good.
 Salt added
 O Lin. slightly
 H. no better

Potassium Carbonate.
 O nothing
 H. nothing
 Salt added
 O Copper is the only one that marks
 H Nothing

Benzic Acid
 O Nothing
 H Nothing
 Salt added
 O + H nothing

Potassium Ferricyanide.
 O Nothing
 H Platina black
 Lin. "
 Nickel fair
 Cadmium fair
 Aluminium "
 Zinc "
 Lead "

Salt added
 O Not around & anything
 H Plat. sensd
 Lin. a little more so.
 all metals mark about same

Lead Acetate
 O Nothing
 H "
 Salt added
 O + H nice

Chic. Acid.
 O + H nice.
 Salt added
 O + H nice.

Potassium Nitrate
 O Copper quite sens.
 + Platinum sens.
 Iron sens.

Salt added
 + Platinum sens.
 Zinc "
 Sn "
 Tellurium "

Potassium Sulphate
 O + H Nothing
 Salt added.
 O Iron react
 + Nothing

Sodium Phosphate
 O Copper quite sens.
 O Iron " " black mark
 O Sn good " for Anticipation by
 electrolysis
 Salt added O + H mix

Sodium Hyposulphate
 O mix
 + Platinum very sens.
 Zn more so.
 Charc on all
 Salt added.
 + Plat more delicate
 decreases delicacy
 increases delicacy of all.

Carbonate of Copper
 O + H Nothing
 Salt added
 O + H mix

Sodium Sulphate
 O mix
 + Platinum slight mark
 Salt added?
 O + H mix

Sulphate Mercury
 O mix
 + mix
 Salt added.
 O + H nothing
 Sn marks without baking

Dil. Nitric Acid
 O + H mix

Chloride of Ammonium
 O + H mix

Arsenate of Ammonium
 O mix
 + "
 Salt added
 O + H mix

Nitrate Strontia
 O. base
 H. mix
 Salt added
 O. mix
 H. (mix)

Sulphate Copper
 O. lead, slight mark
 H. mix
 Salt added
 O. in mark on lead.
 H. mix

Caustic Potash
 O. H. mix
 Salt added
 O. H. mix

Ammonia Sulphuret
 O. mix
 H. mix
 Salt added
 O. in faint mark comes better after
 H. mix

Formic Acid
 O. in light mark
 H. mix
 Salt added
 O. H. mix

Phosphoric Acid
 O. mix
 H. mix
 Salt added
 O. H. mix

Sulphurous Acid
 O. mix
 H. in slight mark
 Salt added
 O. H. mix all done.

Hydroxylic Nitric oxyd.
 O. mix
 H. mix
 Salt added & it all solidified

Acetic Acid
 O. mix
 H. mix
 Salt added
 O. in light mark
 H. nothing

Sodium Nitrate

O mix

H Not very delicate

Lut

all others "

Salt added

O Is quite sens.

H. Radna more sens than before

Lut

Lithium very sens. pamaary
as the other more or less sens

Feldspar of Potassium

O Is very light blue

H mix

salt added

O Copper slightly

Lut sens.

H no good.

1874

July 26

Cobalt pen.

Sulphide of Ammonia

May 24 1874

Guaiacum dissolved in H₂O
10000 shars 3 cells.

Pyrogallie acid

O mix
H mix
All added

O mix

H Iron yellow not delicate
Tellurium very delicate

Potassium Iodide

O Plat.

H Tellurium extra sensitive
not added.

O Platona

H Tellurium same

Bichromate of Potash

O Lead & Tin only

H Mix

* all hereafter mix with salt

Lithium Acetate

H Tellurium good

Acid Potassium Nitrate

H Tellurium only

Potassium Sulphate
H TelluriumPotassium Sulphocyanide
H Tellurium

Benzoic Acid

H Tellurium only

Potassium Carbonate

H Tellurium only

Acetate of Lead

Marked on Lin & Metal
without battery.Ferrocyanide of Potassium
WorkingPotassium Nitrate
Mix

Citric Acid Mix

Sulphic Phosphate of

H Tellurium very sens

Sulphuret Potassium
10 even more pen. than Reg. Dried

Carbonate Copper
No good

Sodium Hyposulphite
No good

Gumcam can slide off on
it can offer this for proof to the
contrary notwithstanding.

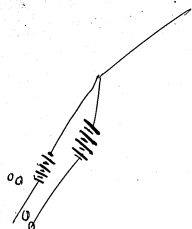
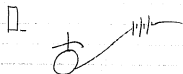
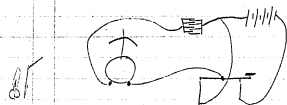
ETB 600 W.

Test to see how much water is driven
off the Boston figulous paper by the
application of the baking process

Took 1 lb of Paper - 480 grains.
Baked it for 20 minutes when
it weighed 456 1/2 grains
which is nearly 5 per cent.

Baked 45 minutes when it weighed 443 1/2 grains
which is nearly 7 1/2% a little more than 7 per cent.
Baked it 1 hour the least quarter of higher
heat. 443 1/2 grains = 7 1/2%

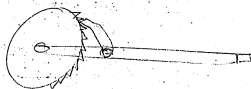
General column with 10 Amm. Amm. + sulphide bar



219
 Antipodal Energy
 Sean Paul Richter
 Paul Twenty-two
 from Eight hours
 now on Vain
 100 Paul mu
 7500 Golden dream
 out

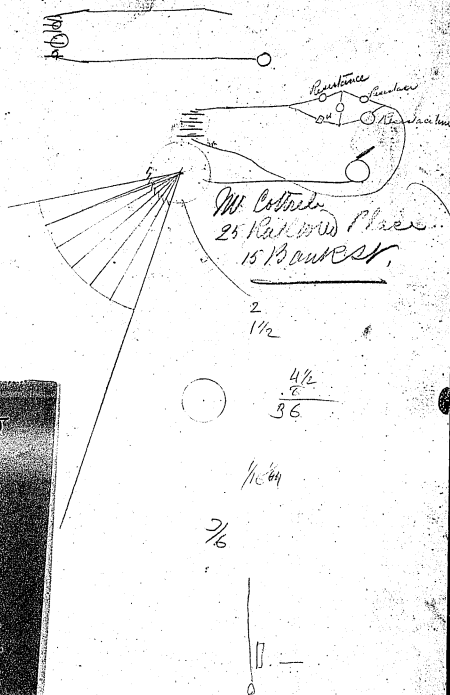
landed
 1/2

88d



Arensford
Jeh
Lyndrup
Armed
J. F. J.

[ITEM FOUND IN BOOK]



Laboratory Notebook, Cat. 1171

This notebook was begun in 1873 and contains only one dated entry, for April, 1874. Most of the notes and drawings are by Edison. There are also a few entries by Charles Batchelor, including notations of hours spent on experiments. The material relates primarily to diplex, automatic, and chemical telegraphy. The front cover has been labeled by Batchelor: "Experimental Researches Vol. 1 Edison's Laboratory." The book contains 148 numbered pages.

Blank pages not filmed: 108-117, 120-148.

Missing pages: 1-24.

E-1675 Oct 17
1875-1876
p. 11 1/10 p. 11

Experimental Research.

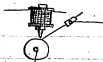
Vol. 1

Edison's Laboratory.

Try experiment on the delicacy of a frogs leg it is stated by Pepper that a frogs leg is 56,000 times more sensitive than an Electroscopie (Condensing). This frogs leg may be arranged to work a second circuit by attaching a circuit breaker to it. It is possible that a live frog may be used, in this case the instrument would be of a permanent character.

Remarks

Try if the freed oxygen from a chemical recording pen can be attracted away from the pen and a decomposition partially prevented, by a powerful local magnet with pointed poles the object being to attract the oxygen away from the iron pen after the current ceases to prevent an elongation of the mark upon the chemical paper, thus.



It is stated by Pepper that Oxygen is magnetic.

Mix a solution of Pyrogallie Acid with potash and make some chem paper. p & iron pen. Pepper says freed oxygen gives a dark brown color.

Try chem paper in solution of Sulphate of manganese.

Schönbeins Test for ozone is 1 part Sod Pot in 200 parts distilled water. 10 parts starch thickened by heating, brushed on bibulous paper. Try effects of decomposing with pens.

Pepper says ozone is present in the oxygen tube of a Voltmeter, which shows that both are set free.

Ozone bleaches Black Sulphide of lead or plumbic Sulphide, oxydization takes place, and white sulphide of lead formed. This may give good Kelgh solution.

Powdered Antimony becomes very hot and combines when placed with iodine.

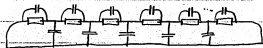
Palladium absorbs great quantity of hydrogen. Graham used two coils like a watch spring immersed in water (acidu prob) and connected the two ends to a small battery, decomp of water took place the free hydrogen being absorbed by one of the spirals of palladium which quickly expanded. when the current was reversed the first coil contracted and the other expanded. It may be that with a proper coil arranged with a lever that the smallest current could be made to work the lever and close a secondary circuit or with mirror throw a light upon a screen.

Test Schober paper - also Boston.

Procure samples for chemical decomp. of paper.

Ascertain the difference if any upon artificial cable between 20 cells high R and 20 cells very low R .

Ascertain if with an artificial cable of a capacity of 1000 miles. The condensers and resistances of another 1000. can be arranged as below to entirely destroy the static charge.



find at what degree of dryness codized and sulphy iron paper is the most sensitive.

1873

Ascertain the highest practical speed attainable with a short relay operated by perforated paper upon 300 mile line. Have static capacity of regular with proper amount of leakage to allow the discharge of relay to have its proper evil effect. The record is given upon iodized paper. The relay repeating into local circuit. Try speed with the relay armature at different distances away also shunted with condenser, magnet etc diversify. Then at best speed substitute Morse Register and large local and obtain highest speed. The polarize Relay in one direction with large permanent magnet and see if speed is increased or decreased. Then on same circuit substitute 200 ohms Relay R for 100. Then 50 ohms and see if decreased induction is of greater consequence than decreased strength. Then substitute a regular polarized relay with shunt on trans and extra bat or N 25. P 50 paper cutting out P and obtain highest speed here.

The matter in Butternut Shucks give a color with Sulphate of iron, get Butternuts.

Chloroform is a test for iodine.

Experiment with the instantaneous formation of metallic tin flakes by Chem Decomp. in glass & on paper to form metallic dots & dashes in paper for repeating.

Experiment on the speed, strength of Current and form of coil which is best to work by induction it may be a primary of 20 000 ohms R and a secondary of 1000 ohms will work with very delicate current.

Adrian 2 12
Patchers

Ascertain if a given battery will just give a perceptible mark through a large resistance, if by using a primary of high resistance and good second of this mark can be augmented.

Try telegraphing from NY to NY via Albany by work armatures only.

Try fittles solution more carefully. Formula, 12 H₂O 4 pt. Sat Sol. Chl Calcium 2. Sat Sol. Pru Pot. add Chromic acid till it gives a cherry color & then add $\frac{1}{50}$ part. Chl Sodium.

Look at English Pat 2429. See if unison worm anticipated

OK Get date contract with G & S. and make list patents out for Edison.

Duplex experiment - Sending two messages in the same direction over the same wire.

The principle is sending reversed currents recorded on a polarized relay for one message and increasing and decreasing the strength of the current to effect another relay. The evils to contend against is to prevent bad effects upon the relay worked by increase and decrease at the moment of reversal, in sending P & N

Currents through an ordinary magnet or Morse Relay the cores must entirely lose their magnetism before due from an N current before they can acquire an opposite polarity due to the P current, at the moment of the polar change there the magnet exerts no force upon the armature hence the spiral spring will draw the armature away from the face of the magnet for an instant, and when the reversals are very rapid the armature lever scarcely comes in contact with the front contact point. To get over this effect of this upon the local circuit containing the sounder, which in this case would

vibrate at each reversal and work the sounder. I reverse the usual method of connecting the local circuit and make connection with the back point, so that when the lever of the relay is away from the magnet, the local circuit is closed. This closes a repeating sounder, (i.e.) a sounder whose lever breaks and closes another local circuit on. When this sounder is closed it opens the second local circuit. So the same effect is brought about as if the relay lever operated the local circuit and sounder in the ordinary way. The reason this secondary plan is used is because when the current upon the main line is supposed to be of full strength and the relay closed the reversals constantly tend to vibrate the lever as the lever flies away from the front contact point but the cores of the relay become re-magnetized and reattract the lever before it touches the back point at a slow speed. Consequently the repeating sounder is unaffected and of course the receiving sounder, but if the reversals are sent very rapid the lever of the relay makes a slight contact with the back point. This would close the secondary sounder were it not that that sounder being a non-receiving instrument may be adjusted very high consequently the slight contact which the relay lever makes with the back point on the act of vibrating is insufficient to allow the repeating magnet to reach its maximum strength which is necessary to overcome the tension of its spring. If I find in actual trial this.

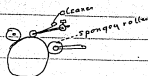
Varied from 500° to 9000°. That the relay. (Phelps 125 ohms) with battery reversed by Double Springs operated by sounders. Number of cells increased or decreased by a second sounder and contact spring polarized relay 75 ohms. 8 cups always on for working polarized relay. increased by adding 16th working sounder by 16. That on 500 ohms Perfect

signals were received and relay had great amount of margin increased to 1000. signals perfect. margin on adjustment of relay increased. increased to 2 3 5 7 & 9000 ohm margin on relay increased with increased resistance, decreased extra battery to 8 cups results same decreased battery 8, regular from 8 to 4 cups signals just as perfect. inserted in line two 200 ohm relays. signals on high resistance 3000 & 4000 ohms perfect, but on low resistance 500 ohms inductive discharge prolonged the opening at the moment of reversal when inverted currents are sent through ordinary electromagnets the inductive discharge are much more powerful than when a current of one polarity is intermitted. Hence the inductive effect of the coils of the receiving magnet themselves are seriously effect the adjustment on short circuits, because the current which passes through them is stronger & the Route for the discharge short by reason of the low resistance of the circuit. One curious thing observed in this experiment is that with a permanent reversible current sufficient to work the polarized relay. That the ordinary relay may be adjusted to give good signals by the addition of but 3 cups to the permanent battery on a R of 8000 ohms the battery may be increased from 8 cups to 40 without effecting the adjustment of the polarized relay.

Trial in New York unsuccessful on account of probably Relays in line, insufficient battery. Battery on line direct by cross or Leakage, & difference in R of Relays, used & poor facilities

make 4 rolls of different strength Sulphat Pot paper.

Have Ac'ls Trans fixed there.



iron roller pen which must be cleaned as it revolves and newly moist Sulphat Kali paper with extra sponge roller to dry in passing through machine - Impossible to keep Roller clean -

A Sulphate or any battery having zinc is more constant in light than darkness, vide zinc in Chem Solubilities,

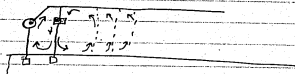
It may be that instead of changing the amount of magnetic resistance to cut the writing that it may remain constant and an adjustable rheostat placed on that side of the shunt containing the receiving paper. — with a paper having a resistance of several hundred miles I can conceive how the shortening of the resistance of the magnetic shunt can bring any perceptible quantity of current from the line considering the immense resistance of the paper. Therefore I think that decreasing the length of the magnetic shunt does not furnish much more if any counter discharge but only weakens the effects of the static so that it is imperceptible on the paper. If this is the case it is better to use one high resistance magnet only in the shunt and regulate the weakening of the static by an ordinary rheostat in the shunt containing the instrument. This will make the resistance at the receiving station much greater than in the old plan hence less discharge will run out or be attracted to that end. The bulk going to earth at the transmitting station. It is possible that a very fine wire magnet



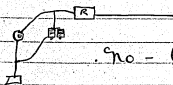
Edison Back to form
All right
12 hours

having a resistance as high as 5000 ohms used as a shunt and and a Rheo in the other branch properly adjusted might be able to give a greater proportionate Counter charge than the ordinary method,

I think that in wet weather the efficacy of the shunt is much less than in dry weather, as the discharge from the magnet in dry weather have but one route practically through the paper while in wet weather there is an extra route for their discharge viz the derivations or leakages near the receiving end thus

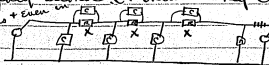


It would probably be a good idea to insert a plain rheo as shown below to ~~use~~ increase R. of the extra route of the discharge, & thereby deflect it upon the paper & at the same time weaken the main & static charge so that the Counter discharge would have a nearer proportion and be able to overcome — A noticeable charge for worse



. No - bad effect

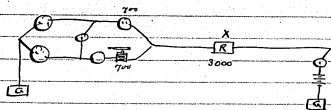
Try this experiment — The additional R. necessary to get efficacy second C. multiplies neg charge exactly as much as it adds + even in series. So its failure



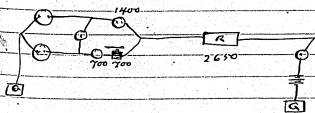
It may take double or thrice the number of

condensers to shunt the resistances as the other to kill the static charge as a portion of their discharge is killed or short-circuited by the R themselves and do not go on the line. Tried Extra R brought in counterbalance exactly the good effects of the Extra Condensers. In fact it did more harm than good.

Test to ascertain if the discharge from a magnet is lengthened by an increase in the resistance of the circuit in which it discharges. Thus:



Increase the length of R of the discharging circuit but insert a Galvanometer in main circuit so that the same strength of current is observed. The loss due to the increase of the inductive circuit is made up by decreasing the resistance of the Rheostat X. The same strength of battery will pass through the relay but the R of the discharging circuit will be doubled. Thus:



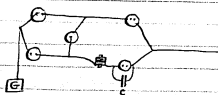
This arrangement should give a weaker, but longer discharge if the discharging time depends upon the exterior R if not then the discharging time unlike a condenser is independant of the n of the discharging circuit.

If the current is not weakened the tension must be very high.

Remarks

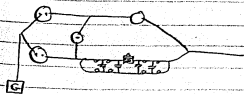
Try sheet lead for secondary batteries, also sheet iron and tin, etc

Try this



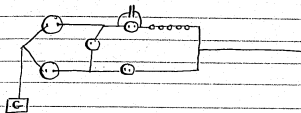
Discharge 26 hours

This

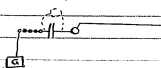
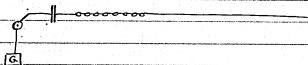


Kill the discharge

Try this to lengthen the discharge

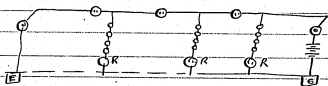


This

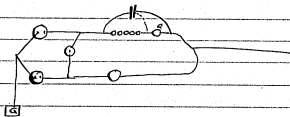


Try the amount of discharge from 6 bottles with water alone, and with various quantities salt, also with

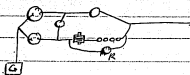
Try this and ascertain if the action is not like a cable



Try this.



This:- The placing of the secondary battery in the direct circuit branch instead of the shunt alters its action as regards the relay but not the line, hence by placing it in this way, the sticking of the relay may be prevented. Thus



Remarks. Both ways work. The cause of sticking is that on the opening of main circuit the secondary sends a longer charge than the relay and the excess goes out on line opposed to the static charge, but a portion circulates within:-

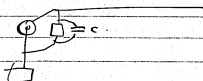
The shunt and this excess makes the relay stick. This is good thing for line but bad for relays. But as the R of the Secondary can be increased, it will not perceptibly interfere with the relay. The remedy is to get the Secondary pile to send short after currents. 7 cells kill the inductive discharge of the heaviest relay I have. 1400 ohms. The R of 7 cells well Satted is about 600 ohms with only water 5000 ohms. first way made relay stick worse than a plain shunt as the 5 battery current was added to discharge. But placing it in last diagram it works against & you can't stick relay but acts with Relay 1400 ohms dash comes thru - shunt necessary sending end. none R end.

It was the jar of current closing lever - made secondary Contact

In my reversal duplex, the effects of the discharge current from the ordinary & polarized magnet interferes with the ordinary relay making it vibrate while the polarized is rendered sluggish. But if the secondaries are applied as shown and not too strong & the shunt is considerable it entirely destroys the effect of the Secondary discharge from relay - and a greater margin is obtained on the ordinary relay while the polarized Relay follows the reversal Key promptly - When a positive current has been on line for any length of time say for a dash the ordinary battery becomes highly charged & when the current is reversed this charge acts with it hence this wave will be stronger than the other and it is this that interferes with the ordinary Relay to some extent, as this relay depends on changes in strength of current - still I think the secondary will benefit greatly this

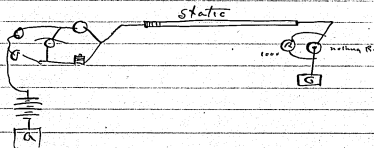
form of Duplex

Try this



Passing Oxygen down one side of a platinum Electrode and hydrogen (Common gas) down the side of the other platinum Electrode immersed in Water Acidulated with Sulphuric Acid and also again with Chloride Sodium gave no current perceptible upon a 6 ohm sounder of a delicate 126 ohm Relay

Try experiments with battery at sending — mistake at receiving end only. Thus



Try a line statically fixed as one side of the bridge to study its nature.

Cedron — Batchelor 16 hrs

Test the induction

Chemical Solution

To a gill of water add tea spoonfull Nitrate Ammonia. To this add what is held on small Knife Blade of aurichloride of Sodium. The paper is white. The marks with iron pen are blue, but with a fin pen yellow at first but soon become purple. (purple of Cassius). The sensitiveness is increased by adding a slight amount (less than that of aurichloride of Sodium) Bichloride. ^{then} there appears after a few hours a continuous mark running through the dots and dashes, — Oh! Sodium does not appear to act as well as Nitrate Ammonia.

Find out if it is the addition of the Corrosive Sublimatum (Bi-chl) that cause the continuous line to appear

When Ferrocyanide solution, with Nitrate Ammonia as given in Culley's Book is used the iron pen is polarized and even on very short circuit the dash commences thus:

When Sulphuret of Potash is used the polarization of the pen is greatly augmented

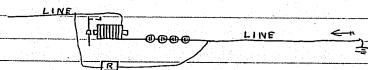
Make 3 large Secondaries with Calland jars & pure water to get a shorter after charge.

Edison & Mitchell 12 hours

Roughen the surface of the electrodes of secondary battery to allow of escape of gases more quickly so as to give a shorter after charge.

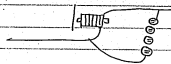
Test with line composed of 6 relays alone. Then place secondaries to each and see what induction of any increase and decrease the number of secondaries to ascertain what is the smallest number that can be used.

I find that the secondaries should be arranged with the relays thus and not as a shunt.



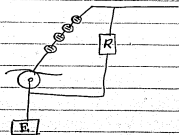
The magnet tends to send a current after the battery is taken off to the left. The secondary battery to the right. The two sources of power keep all portion of the derivation circuit at the same potential hence no current is generated. If too many cups are used the current from them is greater than that from the discharge of the magnet, ~~then~~ this would close the relay again. But if the number of cups are reduced the balance can be obtained or the resistance of the shunt may be made greater and the balance obtained in that way.

In receiving \mathcal{L} If the cups are arranged as a shunt thus.



it is obvious that as the magnet generates a current opposing the main current on closing and in the same direction on opening. and the secondary battery ~~sends~~ reverses this order. that by placing this in the shunt. the two electromotive forces within it are working together although the inductive effect will not go out upon the line. The relay is made to work sluggish owing to the currents both from the magnet and secondary battery circulating in the derivation after the main battery has been disconnected.

In the receiving with a secondary battery is should be arranged with the receiving paper the same as with a relay thus



In a trial with Ballman seven to eight hundred words per minute were received with Relay at Phila. shunted. With no Earth shunt at Baltimore, The number of Cops first used were 15. but 200 words could be received. The number of Cops were increased to 30. with the above result. I presume that with 100 Cops almost any speed

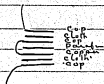
might be obtained with shunt and probably without shunt at sending station.

Secondaries well salted. have the ends of the electrodes barely touch the water see if the gas does not escape more readily and give a shorter discharge.
— No. ~~less~~ increased R decreased discharge

Use two gutta percha wires stripped bare for $\frac{1}{16}$ of an inch at ends immerse in bottle to bottom see if pressure does not force gas up.

The with charge is doubtful - it may be that at the moment the current is closed, too little gas is formed and there is no opposing current set up by the secondaries but as the gas increases an opposing current is generated and this weakens the main current.

Make a secondary battery of disks of copper, cloth & paraffined paper thus:



Attach the secondary batteries to the two relays in my Reversal Duplex so see if the distribution of the induction of the magnet does not make less opening of the armature

of the ordinary relay.

Yes vast difference - there is slight difficulty if the Secondary battery is allowed to be discharged. if a long positive has been sent a negative current will flow from the battery when the main battery is taken off. as it is not taken off but is followed by a negative this in addition to that of the secondary battery makes the negative wave stronger than the preceding positive & thereby interferes with the adjustment of the ordinary, but I think that if the Secondary is proportioned so as to neutralize the discharge from the magnets only no difficulty will be had from variation in strength of the current.

Salt well all the secondaries on hand. Connect for intensity connect them to a fine relay. Then take 6 cups Carbon battery a charge 6 secondaries at time quickly one set after another. see if these intermittent charges are not continuous on relay -

In charging the carbon battery current is thrown into circuit through high R of S battery this kills effect this experiment but the relay shows continuous current less than due from cutting in.

A Reversing Rheotome might be arranged with several sets of Secondary Batteries, and a charging battery, so that one set could be charged for an instant thrown into circuit and the previous one

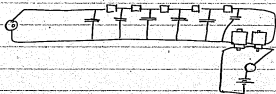
withdrawn & on so on, Problem.

Does 100 Cops Secondary Charged with 10 Cops primary have the tension of 100 Cops in discharging or only 10 Cops, = 3 Cops alternated on 6 half charges it strongly last 1 min - trouble is to keep ckt closed when charging from one charged battery to the other keep chg batty of Connect two relays. Thus to ascertain if the discharge of one neutralizes the discharge of the other



No. Each relay generates $\frac{1}{2}$ as much induction as it would if all the current passed through it. The two send their charge upon the line in the same manner as any two electromotive forces of the same X. would if arranged in the manner

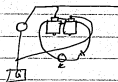
Duplex relay = work over line by induction currents



arrange in first place with battery direct with 300 ohm shunt and small relay in, with best magnet shunt at receiving end, and increase R so that it is impossible to get 100 perfect words per minute, then replace shunt by double coil relay and work with induction currents. See if 100 can be obtained with these induced currents -

Get 10 rolls Baxton perm Reg for records.

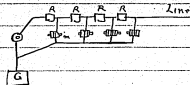
arrange as above (previous inductive Ea) if induction don't work and replace shunt and use Duplex relay as receiving shunt. use one coil only. Then arrange a box of battery with a Bradley Rheo. with second coil, & unplug till the main line current neutralizes the local current and leaves an excess. The theory being that the reversal of the polarity of the iron cores generate more induction than without, second ckt. Try both with & without second circuit. Try without battery by closing coil. Thus



add Condenser thus

Put Duplex relay in bridge, balance. The put a second battery to second coil. to as to balance effect of main. Then see if there is any induction if so if it is not in the contrary direction to what it would be regular -

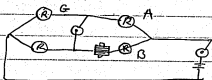
also.



Putchley
Adams

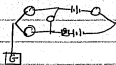
Try it OK

Try this — obtaining the inductive effect free from the main current and regulating the latter so it will just make the dashes.

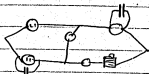


All sides being equal in Resistance no current from the battery passes through the chemical or other instrument in the bridge wire, but the inductive action on the opening and closing of the main is generated within the circuit formed by the two sides of and the bridge. The currents are recorded upon the paper. Any inductive arrangement acting like a magnet ^{Cond etc} may be inserted in these branches and the inductive action observed free from the currents which form it. The difference in resistance of the different apparatus which it is desired to observe is equated for by the Rheostat A.B. so that the same quantity of current is made to pass over the two branches in all cases, and extra magnet inserted at G doubles the effect. If placed in the top branch if placed in the lower branch it neutralizes the effect of the other magnet. This device is very convenient to observe the polarization in liquids with metallic electrodes.

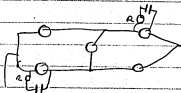
See if the inductive effect of the magnet is affected by the batteries balanced in the bridge thus



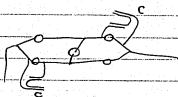
Try this



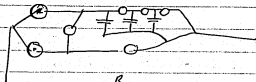
Try with magnet & without, see what condensers will do. Then this to get longer charge



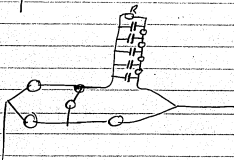
also



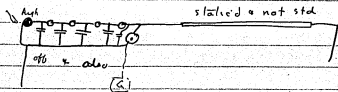
Try this



This



This



stated & not std

Try if working on well stat'ed line is doubling quantity will form dots & dashes thus be careful



The excessive amount of iodide of potassium used for the regular solution led me to believe that only a certain amount was necessary to give good mark and the balance only increased the Conductivity but I found that by using a small quantity & adding HCl Sodium to give the requisite Conductivity that it is a failure & the excess of Iodide Pot is unnecessary probably some KNO_3 might be used that ~~it would~~ not redissolve the Iodine & at same time give the paper proper Conductivity.

Try effects on Duplex relay in bridge by closing second coil = Nothing noticeable =

Try receiving on well stat'd line with battery at receiving end and arrange thus

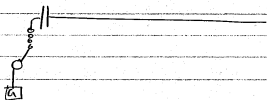
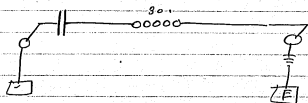
Try and see if a number of bottles with pure water only arranged along resistance after the manner of an artificial cable does not imitate the Atlantic.

Thus

over



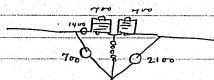
Try this to lengthen the discharge.



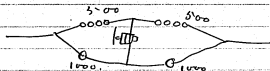
Get double pen holder made.

Get some Alkaloid Eggs for albumen. Charcoal
White Sugar. Onions red beets Red
Cabbage Syrup Violets Petal Red Rose
Hollyhock flower Brazilwood.
Yerba mate. Lump of manganese.
Subchloride Copper

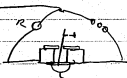
Try this on Shop circuit to see if it will
induct. second to see if Relay doesn't
shut



This.

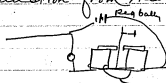


This



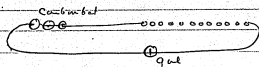
No good secondary
Varies according to time
Closed & opens it works
but impracticable for
above reason

See if any induction from this



Find out what that thump is that is felt by
finger on receiving pen when paper every time
ckt broken.

Try this

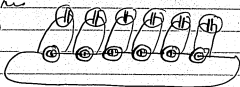


no good

Try ferrocyanide & ferric sulphate soln - & after
recy dip in Sol Nitro & Pyrogallol acid

Treat foil with Sol Gall. go for marks to
make them insulate

try the



See which is strongest G with Secondary or without. The Secondary should be well salted - adds nothing cuts off in direct weak by opposing & with H. heat iron receiving pen with glass tube pointed with flexible rubber pipe to gas to see if the protoxide is not more readily formed.

Chemical Solutions

Try Caustic Potash - water - iron pen -
- No Mark -

Try Carb Pot. iron pen - water, - salt

Try Carbonate Pot copper pen water - salt
Caustic " " " " "

Try Iodide Ammonia - water starch
platinum pen - Potash bleaches blue color
formed by combination of Iodine with starch.

Try Citric Acid water iron pen - develops in
Ferrocyanide & Ferridcyanide, Try salt.

Try - Dissolve Indigo in Sulphuric acid
iron pen, perhaps salt -

Try Carbolic A. iron pen water - S + S

Try Arsenious A. Copper P Water S

Arsenious acid almost insoluble in water.
Readily S in B water & Hydrochle A

Try Cyanide P. & Peroxide Iron - Water
S. Iron P.

Try Sulphocyanide K. H_2O & chl. chl.

Try Ferrous Cyanide, Silver P. H_2O chl. chl.

Try Bromide K. chl. chl. H_2O all the pens

Get some Hydroferrocyanide A.

Try Acetic A. Salt iron P. H_2O .

Try Meconia A Iron plume, then chl. chl.

Mem - Nitro Prusside Sodium Pharm p 145-6
delicate test for alkaline Sulphurates,
such as Hydrosulphate ammonia &
Sulphate K.

Test that have been made, recorded
slips in Scrap. B. Tests of addition to
Regular Ferrid- H_2O chl. chl. solution.

Chl Lime - mark light brown yellow soon
fades, whitens paper slightly, mark very
inferior -

Citrate Magnesia - mark blue inferior

Caustic Pot. mark yellow inferior.

Phosphate Soda. mark blue, which time
intensifies strongly.

Caustic Kⁱ & Ferrid in Excess - Mark yellow scarcely perceptible,

Agua Ammonia, Mark drab, inferior very

X Borac Acid, Mark Blue - Good but slightly inferior

Silicic Acid - Mark Blue. inferior - S Acid insoluble

Sulphate Potash. Inferior slightly

Carb Soda - light blue mark very inferior

Saltpetre - Blue mark slightly inferior

Sulphate Copper - Blue mark. slightly inferior

Sulphate Soda. Blue mark. very "

Formic Acid. Blue mark. slightly Infr

X Acetate Lead. " Inferior, after paper dry it is white

Alum - Inferior

Graude Pot. Mark yellow very Infr

Carb Ammonia, Mark light drab very Infr

Stearic Acid insoluble - dont effect

Hydrosulphate Soda - marks unchanged

Sulphate Zinc No mark

Arsenious acid - no change

Sulphuret of Calcium - blue mark very Inf.

Iodide Potassium Blue mark Inferior

Muriatic tin - no good without salt, probably poor conductor.

Benzole acid Blue mark, Very Inf.

Galls. " " " "

Acetate Manganese " "

Ferricyanide K. " "

Nitro Peroxide Sodium " "

Spirits Camphor - perceptible, no chge if any slightly Inf.

Chromic acid very inferior

Nitric & Pyrogallol. A. no regular - very inferior with both am & tin pen

Hydrofluoric acid very inf.

Flower sulphur insalable

Oxalic acid blue mark slightly Inf.

Chloric acid " " " "

Potassium salphocyanate " "

Nitrate Cobalt, light blue - very Inf

Nitrate Soda, Blackest, blue, slightly Inf

Bichromate Pot, Ragged dark blue mark,
slightly Inferior

Ammonio-Citrate Iron - Green mark S. Inf

Bichl Mercury " "

Bichromate Pot & Sul. A. very strong when
leaves pen fades to light green. Inferior
Ferrous added in Excess "

X
Starch added gives the paper a glassy
appearance whitens it and the
Turnbull blue is deposited in a
great measure on the starch which
gives mark a fine sharp appearance
and the color is somewhat deeper
than with the regular solution.

X
Sulphuric Acid added gives a deeper
mark than regular owing probably
only to reduction in Rag paper
which would be of little worth an
long circuits.

Nitrate Silver - Better than Reg. no
deeper mark -

Black Ox Manganese light green
mark. Inferior

Sulphuric A. & Ferrous alone - very Inf

Peroxide Iron — good. deeper than reg — mark ragged.

Gallie Acid — Blue mark. Inf slightly

Hydrosulphuric acid — Inferior.

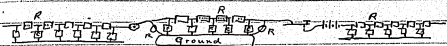
All above test is shown in
Chemical Strip in Scrap book
Allen & Mutchels 21 hours.

Test the induction on a clear line of the relay in balance or bridge. Then with a line of same R. statically arranged. Test the amount and character of the induction from same relay and observe what effect the gradual fall of the main current has upon the inductive discharge. Try same with secondary batteries.

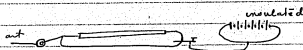
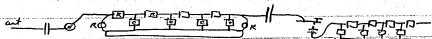
Make four bottles secondary battery, place them in one side of bridge. first fill with 4 pennyweights Muriate Ammonia then 4 do of Sal Soda — Alum — Bic Pot — Iodide P. — Citric A — few drops. Sol Sodium — Nitrate Am — Liquid Am — Glacial Acetic A — Citric A. Sul Cip — Sul Acid — Ferriol — Sul Zinc Black Ox many & all the other chemicals

Lp 100
 Edition of Pacheco
 1st. Copy

Cable Experiments -

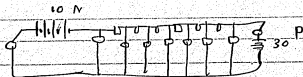


Transmitting a P. Current both through ground and Cable with two static abatement for grounds.



See what speed obtainable on 9000. Ohms R with one cup battery Iodide paper. If no mark try to improve Iodide paper till mark obtained

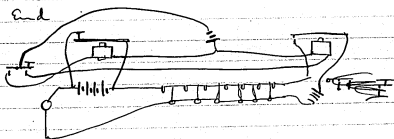
Try this



also test if a Voltage Battery put in circuit immediately after the dot has been made sent & the sending End to air will have any effect on stopping the flow from the Condenser. Use same number of Elements to Kill Charge from Condenser as is used to send with. if it does not Kill the discharge or have any effect then

It is perhaps possible to transmit with Voltage & static E at the same time, and perhaps a Compensation might be devised upon the difference in these two forms.

It is also possible that it is better to work at sending end with static from an artificial, or to make the mark with voltage & send reversal with static or vice versa - Try with 20 p at receiving end and 20 in same direction sending end.



also reverse send with P & N. The battery at Recg End to oppose static when Cut in.

I have noticed that a Morse Relay on a Regular line works much sharper with a battery at both ends than when the battery is at the sending end only. When the latter is used the N - etc stick and the writing is light which is not the case when 2 batteries are used. The sticking acts precisely like the effect of the static charge. Of course when 2 batteries are used in opening the Circuit one battery is cut off but the battery at receiving end remains on & perhaps keeps the line

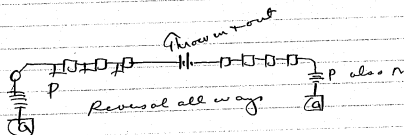
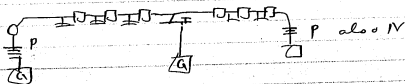
charged or prevents the static from flowing out. If it however performs some good function test this -

It is possible when we consider that both batteries form the static that it would perhaps be better to have several turns the number of Cups at the receiving end as at the sending end.

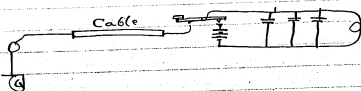
Ascertain if the induction is as great from a magnet with its Cores Nearly saturated with magnetism, as when it is free from magnetism. Use a bridge and a Duplex relay the Extra Coil having a good battery permanently attached to it the bridge connected to the line free of static. Be sure that the magnetism in the Cores due from the local is the same as that induced by the Main battery.

It is possible that 40 Cups kept permanently on the cable at Receiving End the signals could be made better by throwing in & out 10 Cups at Receiving End without breaking circuit. Then they could be using the whole 50 at sending end.

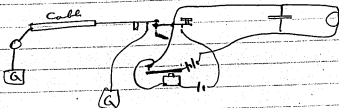
attract the static.



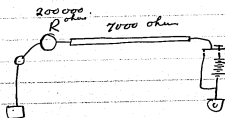
Use the static charge to work the cable



If it is necessary to put regular to ground use the arrangement

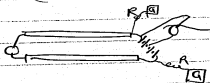


W Siemens improved etc - that when a current is sent along through a submerged cable - a quantity of Electricity is retained in charge along the whole surface be distributed, proportional to the tension at each point - Rep Joint Com Eng p 381
Therefore



Shellac thickly the iron receiving drum or make a hard rubber one. Use 4 receiving pens for Roman on two wires place 2 sending 22 Reag pens one letter ahead of the other two

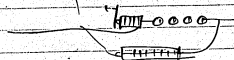
Try two static arcs thus



In the Duplex transmitting two messages in same direction, place the secondaries in to kill self induction. Then shunt the shunted Relay (Common) with a magnetic temporary delay Box - hence - Thus

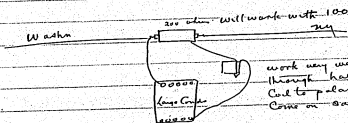


or probably the



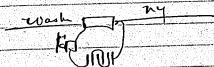
Tried this Duplex on 'stated' line = Equal to Pittsburgh

Tried it stated & Return with Condenser like the 3100 W plan from Washington



work very weak with 1 amp through half of Duplex. Had to parallel it. W & NY Come on same adjustment

Tried it with secondaries 7. in one of the branches leading from Rheo in line to Condenser tried in both branches but didn't make any perceptible change = Tried the Condenser this



got no Current it was probably too short to work relay

Tried this



Metals precipitated by Reagents. highly diluted to ascertain what metal with what Reagent will give a color at the highest dilution -

First Sol. Water 24. Fluorid ounces

Second - " 12

Acetate of lead. " 1 fluid drachm of

1 fluid drachm of NO 2
put in NO 1.

a little of the solution put in a test tube
tested with hydrosulphuric Acid -

(Vague precip yellow prob due Sulphur from Water)

2 fldchm NO 2 in 1

(Vague - Grey Opal Color)

6 fldchm NO 2 in 1

(Vague)

17 fldchm NO 2 in 1

(Better)

- Standard

Sul Co

1 fldchm

12
Pdx

2. highly
tal with
color at

es
fluiddch of

2
test like
id -
Sulphur pure to
Water

Standard

22

Hydrochloric of No. 2 in No. 1

Subsop	No. 24 Hydrochloric fluiddch	No. 2 12 Standard Sulphur	Remarks
Sullop	"	"	quies some with water vague
"	"	"	vague "
"	"	"	little vague yellow
"	"	"	better yellow persap defined fine to sulphur less solution
Mun In	"	"	coat persap
Tinct emine	"	"	" - fourth test it
"	"	"	well defined equal to standard
"	"	"	Tinct of Bismuth
"	"	"	vague yellow add Muriatic & ammonia clarifies equal to standard
"	"	"	quite dark with ammonia no Muric acid
"	"	"	harder than other 3 and Hydrochloric acid gives black precip
"	"	"	dark that left standard

Remitt
that has
in Muriatic
but
pure

24 flusdowns water first solution - 12 ounces water in second solution. grain of all-ick displaced in second solution - Tolune
 gives name of salt. 2. The best chemical 3 1/2 amount No 2 sat part in No 1
 192

	1	2	3	
Sulphate iron		Hydroxylated	8.	Ugine
"		Hydroxylated	8	Sulfate black-

Get Resis. of Iodine paper moved 3 inches per sec.
to prevent the I from insulating the pen. See if the
resistance don't decrease as battery increases.

Make 'Little's' solution

12 Water

4. Sol. Chl. Cal.

2 Sol. Sol. Potassium Pot.

add Chromic ac. till it assumes cherry color
then add to part Chl. Sol.

Syr. in place of Potassium Pot.

5.9 Potassium Pot.

1.9 Water

1.0 Chl. Sol.

a little HCl



CAUGHT IN THE ACT.

GERMAN CHARACTER SKETCHES.—[See Next Page.]

Result.

Result

Result: with this solution I get a light blue paper & a dark blue mark with an iron pen but it does not come out for a short time. No better with excess of either. At this vol. throws a blue precip. with sulpl of iron, added some sulpl ac. but no better results.

Bichloro-wood solution

1. ~~What~~ Ammon. Nickel dark Sen V
~~table~~ Tin. Violet Sen M
 Copp - dark Sen V
 Plain with Zinc Res. Note

addition of little Aqua Ammonia darkens
 the paper but increases sensibility paper
 probably by redrawing Resin. 1 Cell
 Nickel 1st Copp 2nd Zinc 3rd in solution
 with Excess Aqua Ammonia.

2
 Log. Sul Soda - Tin Copp Silver Nickel
 Copp most sensitive, addition
 permanganate Pot. Colors paper deep
 Nickel & Copp only. Not very
 sensitive

3
 Log. Chl Ammonium - no metal except Tin
 gives color, purple sensitive paper light
 yellow to same add Chl Soda
 pink: after whole saltn Tin on
 gives very light purple mark which
 too thin with except platin gives
 a mark that Black & to Copper don't
 come out for first instant, later due
 to Zinc underneath by wetting new
 slip & ~~res~~ connecting all pens to Zinc
 get that purple mark on nearly all pens
 but it quickly fades quite sensibly
 won't do it on platin base but on
 Tin foil base.

Log - Sulphate Sodium - Chl Sodium
with Nitro Acid in pen yellow paper
- Purple Marks with tin pen only
first imperceptible but comes out more
sensitive than ferrid. 1 Cell through
10000 ohms - _____

Log-Sul Manganese Copp. spec. - mtdg
Sensitive,

Worked all night
Oct 11 12

118

Experiments with the new force
Chem Decomp moving a line - April 10-74

Reversing a Current does not help it a bit
with Potassic Hydrate.

Potassic Hydrate in paper rather dry OK -
fused Zinc's Chloride, increases friction
when Hydrogen evolved on lead, very strong
but probably not so strong as hydrogen
releasing friction with Potassic Hydrate.

Silicic Hydrate Acid, increases friction when
hydrogen is evolved, probably more valuable
than with Zinc's Chl.

Oxygen appears to produce no effect
in either,

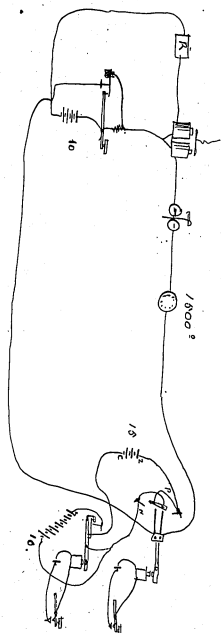
Hydrated Silicic Acid & Potassic Hydrate
Hydrogen decreases friction, not so strong as
without hydrate. Silicic A. apparently

Sodic Phosphate, H die free, not very
good

Ammonia Chloride - very poor if anything
on either

Mercuric Sulphate ^{the had little ammonia chloride in it} increases friction greatly
with O. decreased a little with H

Mercuric Nitrate - not so good acts both
ways like Mercuric Sul



$$\begin{array}{r}
 200,000 \\
 112,000 \\
 \hline
 88,000
 \end{array}$$

50

Each 4 of us own 25 in 100
 offered 20 parts of hundred
 leaving Each 20 parts in 100
 Read 12000 for my 500 20
 Making 4 more parts in 100
 for double that is 25000 a 5

5

100

$$\begin{array}{r}
 112 \\
 560,000 \\
 \hline
 1
 \end{array}$$

112,000

4

Laboratory Notebook, Cat. 1170

This notebook covers the period November 1873-December 1877. Most of the laboratory notes and drawings are by Charles Batchelor; a few are by Edison. The material relates primarily to batteries, induction coils, and telegraphy. There is also a list of basic scientific questions, ranging from Newton's law of gravitation to atomic theory. The book also contains numerous accounts and lists of prices, stock, and hours worked. The flyleaf is labeled "Experimental Researches." The book contains 74 numbered pages, followed by 11 unnumbered leaves. Some leaves have been torn out.

Blank pages not filmed: 18-19, 24-25, 34-49, 52-53, 56-57, 60-69, 72-73.

Missing pages: 27-28.

E4896
Cat. 1190

Ledges
Balances

Telephone with
one

7
Experimental researches.

Batteries. Page 1. Condensers 20.

A
B
C
D
E
F
G
H
I
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Induction coils 10

I
K
L
M
N
O
P
Q
R
S
T
U
V
W
Y
Z

Platylabus, lucia 8

N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Solution Chemical Backs - 20

R
S
T
U
V
W
Y
Z

Common Cell, Battery Experiments, Bradley Johnson

1

1573. 14 Carbon Cell
1 Outside Water
Inside Water
Deflection 1 2 3 4
Nov 27 10:35 AM 17.5-1-
28 8 P.M. 19.5 1/2 1/2-

Outside Water 2 1 Hookfull
of Hydrochloric Acid.
Inside Water 32 Hydrate 2 4
Nov 27 10:45 AM 27.2 1/2 2 1/2
28 8 P.M. 26 7/8 26 7/8

3 Outside Water
Inside Electrolyte
Nov 27 1 2 3 4
10:10 AM 69 7/8 73 2 1/2
28 8 P.M. 27 27 43 12

Outside Water 100 Hydrate 10
Inside Water 32 Light Soda 2 1/2
Nov 27 11:15 AM 136 2 1/2 11 7/8
28 8 P.M. 11 9 6 1

Outside Water 100 Hydro Sulph 5
Inside Water 32 Chloride 1 1/2
Nov 27 11:25 AM 52 2 1/2 3 1/2
28 8 P.M. 39 28 10 1

Outside Water 100 Hydro Sulph 5
Inside Water 32 Chloride 1 1/2
Nov 27 10:25 AM 55 2 1/2 13 2
28 8 P.M. 19 15 6 1

Outside Station Hydrocellular
Grade 110 52 Sept. 27 1888

Nov 27 10:36 am 57.52 41.8
28 8:20 am 46.41 25.8

1874 May 9.

I found that when I put
bichromate crystals into the
panes & then poured water
& within 2 1/2 inch 17 top
adding sulphuric acid
the battery formed a great
deal stronger.

1875

April 10.

Ordinary Electropanes
a porous cup & water outside
with zinc outside &
Carbon inside makes a
good battery

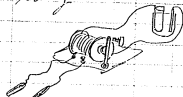
15/4

Induction Coil experiments.

Apr 18. Wound spool for jungle current & to make
1. I have quick & sure wire. Got shock but
not very strong. Size of old relay spool

2. ~~Wound~~ Wound 3 layers sounder wire round &
core & fine thin wire, var & I fill it
very good shock from Carbon battery

3. Made coil longer & put 4 layers sounder wire
on & filled up with fine thin wire, spool being
about 5" long. & weighing about 1/2 lb.
Made battery out of an old glass jar & put
a piece of sheet zinc & small piece of Carbon.
The induction from this arrangement was very
strong.



Apr 26. Made coil like following:



4 layers of Register wire & then
fill up with 36 Dia wire & then
cover in paraffine for about
1/2 lb.

Bring in Paraffine almost double the strength.
Core made of pieces of iron wire instead of solid
is much better. glass jar ought to be lots of
surface on the handles. Small Carbon battery
then works first rate.

Dead?

1. Prometheus Box

1. " Recorder

1. Bark Bent Relay

8. Rollo Indian Paper

Nov 22	John Krueri for	18	Edging Machine	30
	Edging Machine	100		
	1000 2 planers			60
	Patterning for Pine Board	25	1000 Engines	20
	Boy Tom	5	15 Ames Lathes	4
	J. Adams	5	17 Engines	10
Nov 19	Tom	5	Nov 26 Edging Machine	36
	Boy working paper	2	14 1/2 50" Edgewood Lathes	240
			27 Engines Lathes	30
			14 1/2 30" Edging Lathes	150
			Low 30" Planer	4
			Low 4" to Low 30" 40"	
			Workbench Lathes 20	
			Edging Lathes	
			8 Edging	150
			Drill press	36
	Jay 8" Hand Lathes			60
	Workbench			20
	Edging Machine			11
	8 Workbench			30
	10 Planer			2

Stock

work	Ending Nov 26 th		Work Ending Jan 7 th 1880	
Nov 26	1 Gate fluid	1000	Chas. Wright	65
	2 1/2 glass jars	80	John Krueri	12
" 29	4 1/2 Pen boxes		John Ott	8
	62 Rods		John Egan	10
	10 Distilling Appar			
" 29	12 Rolls Siderow	144	Feb 12 th	
Work	Ending Dec 11 th		Chas. Wright	70
20	Tom's 1/2 lb Sulphate Copper		John Krueri	13
	Sodium Potash	32.50	John Ott	43
	1 Box Enclaves		John Egan	20
Dec 11 th	20 Pens at	33.00	John Egan	13
" 15	25 Pens at	3.40		
	Sodium Potash	1.00	Feb 20 th	
	1 jar for fluid	1.00	Chas. Wright	65
" 20 th	50 lb Glycine		John Krueri	3
	1 lb British Soda		John Ott	45
	12 Bottles for Ink		John Egan	10
Jay 17 th	1 Iron Suck roller			
	2 hours work			
	1/2 lb Wrought Iron			
	1 large glass jar			
	for Condut v Hanson			
	Battery			
Jay 29	15 Pen screws drivers			
	6 Can Cords Soland			

Recd from Gilleland & Co

187-

Autograph Press
Parts

No

Sept 20	Roller	3
Oct 4	"	1
" 8	"	2
" 8	"	3
" 9	"	2
" 11	"	3
" 23	Presses	2 27.39
" "	Rollers	4
" 30	Presses	9-50.39.53.56

42, 88, 67, 57, 83

Nov 1	Key	34
" 5	Key	1
"	Rollers	31
" 7	Presses	5-89.24
	27, 63, 44	

Nov 1st Klein's Battery 11

" 10	Battery	7
" 11	"	2
" 11	"	3
" 12	Dist Boxes	3
" "	Battery Park	2
" 13	Dist Boxes	7
" "	Presses	4
" "	Batteries	9
" 15	Battery In-tn	3

Solutions for Chemical Etching

Solution *Symbol* *Color* *Mark*
 Potassium Iodide (K.I.) White Sol.
 Potassium Perm. & Sol. Grey Sol.

1 Cap Carbon.
Base Value

100

<i>Time</i> <i>Exposure</i>	<i>Time</i> <i>Development</i>	<i>Time</i> <i>Fixing</i>
20	C.	100
10	2	10

Chem. Action

Recd from Wirth or Shop

	Pens	5
	Pens	10
Oct 6	Pens	20
" 6	Pow Boxes	100
" 25	Pens	5
Nov 5	Pens	20

E. H. Johnson

Oct 13th one Press complete
 York Agents Box
 W. S. Express co
 Cleveland O,

B. H. Johnson

Press complete not paid
 Oct 11 " " without Battery C.O.D.
 " " I. B. A. David
 " 1st Ave & Wood St
 Pittsburg Pa - 1 C.O.D.
 " " B. F. Johnson 1 C.O.D.
 " " De Haven's Thronand
 407 1/2 St. Philadelphia 1 C.O.D.
 Oct 19 one Press, roller
 & Batt Box Hunkabe
 returned
 " 25 Morris & Smith
 150 North 3rd St Phil
 27 1 Roller & 1 Bottle blue ink
 also 5 one Press complete & 1 Jug of ink
 241 Chestnut St Phil (addressed)
 " 5 one photograph Press complete
 Chas. F. Garrison
 223 South Front St Phil
 Nov 9th one Extra horse cup

Condensers.

W.F. 8.16

1 Press Complete without battery to Patent office
Nov 7 one Autographic Complete to L. A. Edison

Press to Agents

J. C. Sullivan
103 Waverly Place
N. Y.

Oct 15th
Press complete 1 CAD

Blumenhanset & Editors

Nov. 5. 1 Press complete

" 4. One Press complete

D. Tugot & Sons, 111 Chestnut St Philadelphia Pa

press sent to Millers

Nov. 5. 2 Presses without Battery or Press

2 ex ha bottles blue ink

" 11 One Pen for above Press

" 11 3 Presses

" 9 1 " New ark a.k.

" 5 1 " Philadelphia

" 5 1 " Boston

" 15 1 " Newark

" 16 5 " New York

1. Explain Newton's law of gravitation.
2. What is Avogadro's or Gay-Lussac's molecular theory?
3. What is the molecular condition of the three states of matter Gas, liquid, & solid?
4. What is about the size & weight of a molecule?
5. What is meant by chemical combination?
6. " Analysis?
7. " Synthesis?
8. " The Atomic theory.
9. What is the theory of combustion?
10. What are Alkalies & Acids?
11. Describe the Magnetics?
12. Describe the Magnetism?
13. What is an Arithmetical?
14. What is the manner of 'inversely proportional'?
15. What are the Laws of Motion?
16. " " " " Charles

J. T. Murray in Co with Dr. A. Edson

Aug 18th 6 Self Winder belts
 " 26 6 Rolle Bonartie paper
 " 30 2 sets of Alphabet W.R.
 " 6 letters for W.R.
 Sept 4 1 Die Holder
 1 Reamer for big brass bar
 1 Pk lever drill jig
 1 Pk lever " "
 1 Drill jig for extra escapement
 3 Large brass jig drill
 1 Base jig for extra hole
 1 T piece file jig
 1 V piece drill jig
 1 V " file jig
 1 Cook piece drill jig
 1 Paper reel arm drill jig
 1 Pk lever sho. drill jig
 1 Upright drill jig
 1 " file jig
 1 Ink roller guide drill G
 1 Union bar drill jig
 1 Stage click drill jig
 1 Ink roller arm drill G
 1 Stage click file jig
 1 Extra escapement lever
 file jig
 1 Armature drill jig
 1 Union arm file jig
 1 Upright file jig
 1 Cook piece file jig
 2 buffer file jig
 1 T piece drill jig
 1 Link file jig
 1 Feed click file jig
 1 Pair Pk lever jaws
 25 Adjustment pins

1 Punch & die for nuts
 1 Brass base for W.R.
 100 Fed Click Armature screws
 10 Bind parts half finished
 15 Washers
 25 Magnet screws
 172 Type wheel nuts
 40 " " half finished
 16 " " covers
 40 cores
 20 Armatures for W.R.
 6 big magnet plates iron
 3 short do do
 3 short brass do do
 1 long do do do
 2 " " " "
 1 jig Perforator drilling thru
 in brass bars
 300 Stage pieces
 300 " Clicks
 300 Uprights
 300 Union buffers
 300 V pieces
 50 W.P. Type wheels
 1 drill jig for Magnet plates
 2 Punches & die for Perforator
 5 lb brass castings
 8 " " "
 27 Cook pieces
 10 lb iron rod
 1 small culture
 1 die Holder
 2 filed oz set And
 1 Punch & die for Printing lever
 1 drill jig for Upright piece
 millen's gale for escapement lever
 and mill for same

2 jaws for paper reel
 2 Milling jaws small
 1 square punch for nuts
 1 Punch & die for Union screw
 1 file jig Printing lever
 1 die for escapement lever
 1 Upright Punch & die
 1 Taper " "
 1 T piece Punch & die
 1 Punch & die extra
 1 Punch & die for Stage click
 1 " " for length
 3 die for ink roller arms
 1 small Milling jaws for die
 1 Punch for Cook pieces
 1 Punch & die for Stage piece
 1 Milling jaws for Stage "
 Nov 5th 12 1 Volving pin
 " 1 lb flat rubber
 " 6 Printing lever Armature
 " 1 lb Brass
 " 17 1 lb Brass
 " 60-148 Armature screws
 " 50 Adjustment pins
 " 4 1/2 Iron brackets
 " 20 50 Adjustment pins
 " 22 5 Links for Governor
 " 3 Printing levers
 " 24 50 Small Relay Armature
 Jan 30 1 Governor Crank pin 603
 5 1 ball

Recd from J. L. Murray

Nov 1st 48. Receiving pens
 " 12. Delivering pens
 " 14. 16. Giving rubber

Domestic Tel. Co. Newark

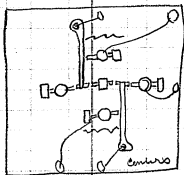
Nov. 12 4 Rolls Kodak
 Nov. 29 12 Rolls Kodak
 Dec. 18 12 Rolls Kodak
 Jan. 14 12 Rolls Kodak
 Feb. 25 12 Rolls Kodak
 " 27 10 " "

Domestic Tel. Co. N. Y.

Nov. 8 12 Rolls Kodak
 Nov. 20 12 Rolls Kodak
 Dec. 18 12 Rolls Kodak
 " 29 12 Rolls Kodak
 12 Rolls Kodak
 12 Rolls Kodak
 Feb. 27 12 Rolls

my Recd 1 Bbl Kerosene Jan'y 8th 1877

9 th Edison's House	gall	2
12	Shop	2
13	Charles Edison	1
15	Edison's House	5
13	Adams	1
15	Shop	2
16	Krusin	1
17	Shop	2
20	Chas Edison	1
22	Shop	2 1/2
23	Edison's House	5
23	Adams	1
24	Shop	2
26	"	2
30	"	2



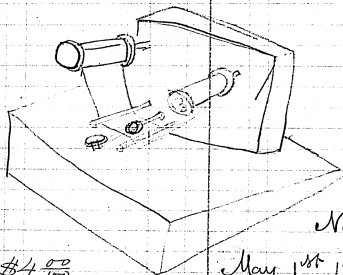
\$ 7 ⁵⁰/₁₀₀

No 20

Am 30th 1877



Hand Stamp



No 21

May 1st 1877

\$4.00
100

Altered for firing speedoscope

No 22

\$2.00
100

Kinsol's time Dec 1877

(Mar 1878)

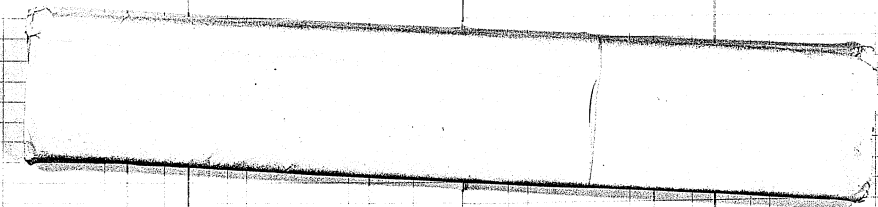
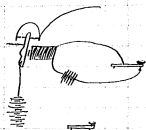
See original time sheet in
Box 1877 - Phonograph

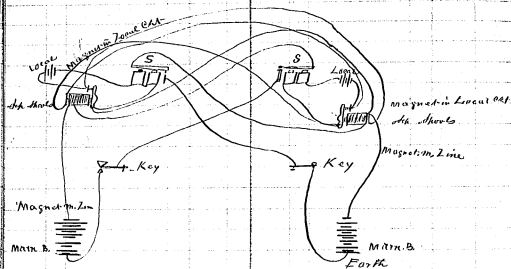
Box	1	Phonograph	10	100
2	"	"	10	
3	"	" ^{or 4} ^{to Museum}	9	
4	"	"	13	
5	"	"	13	
6	"	"	15	
7	"	Patent-offer Model	10	
8	"	"	8	
9	"	Phonograph	4	
10	"	"	9	
11	"	"	10	
12	"	"	10	
13	"	"	10	
14	"	"	10	
15	"	"	10	
16	"	Telephone	11	
17	"	"	10	
18	"	Phonograph	12	11 4
				18 5
19	"	"	5	
20	"	"	13	
21	"	"	10	
22	"	"	9	
23	"	"	7	
24	"	"	9	
26	"	"	9	
27	"	"	10	
28	"	"	13	
29	"	"	10	
30	"	"	8	
31	"	"	9	

Cash to Edison \$3.50

Cash to Edison 6.00
100

Alcohol Shellack Paint \$2.75
112





Automatic Repeater

Laboratory Scrapbook, Cat. 1168

This scrapbook covers the period February 1874-January 1876. The laboratory notes and drawings glued into the book are primarily by Edison and Charles Batchelor and relate to telegraphy. There are also paper-strip recordings of musical tones and the human voice. The book also contains many clippings about the telegraph industry, including several large cartoons depicting the Western Union monopoly and the power of Jay Gould, as well as other clippings dealing with matters of technological, scientific, and economic concern. Business-related material includes forms, price lists, and a service map of the Domestic Telegraph Co.; a price list from George Wale & Co., philosophical instrument makers; and advertising circulars. The cover is marked "Vol P."

The book contains 62 numbered pages followed by many unnumbered leaves, all but one of which are blank. Several leaves have been removed from the middle of the volume.

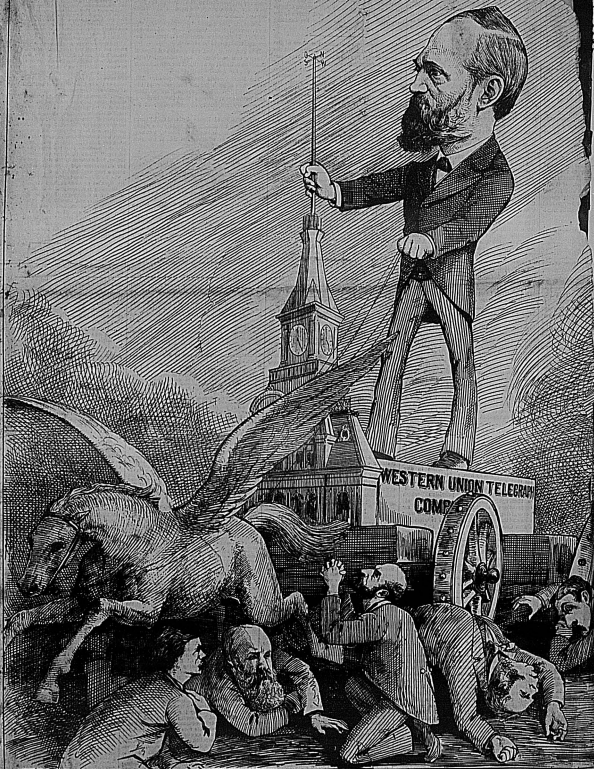
Blank pages not filmed: 53-54, 61-62.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1

Cat. 1168

CHEMISTRY

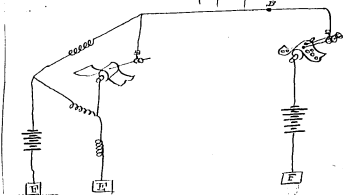
SCRAPS.



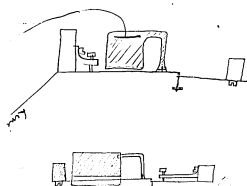
THE GREAT TELEGRAPH JUGGERNAUT.
HOW THE TELEGRAPH MONOPOLY TRAMPS ITS VICTIMS.

THE CENTURAGE
monopolies in
tion to the fact that
trade, or 20% of the
the foreign value of
ion, and that water
quantity of the in
tained above this
and he was not
which the water is
the money will
be paid. Dr. Coud
at tied with damp
the importance of
the water, and a
now on hand, 177
but this there is a
the the water
generally are high
and in low water
commerce, there
of great interest

Fig 17



2

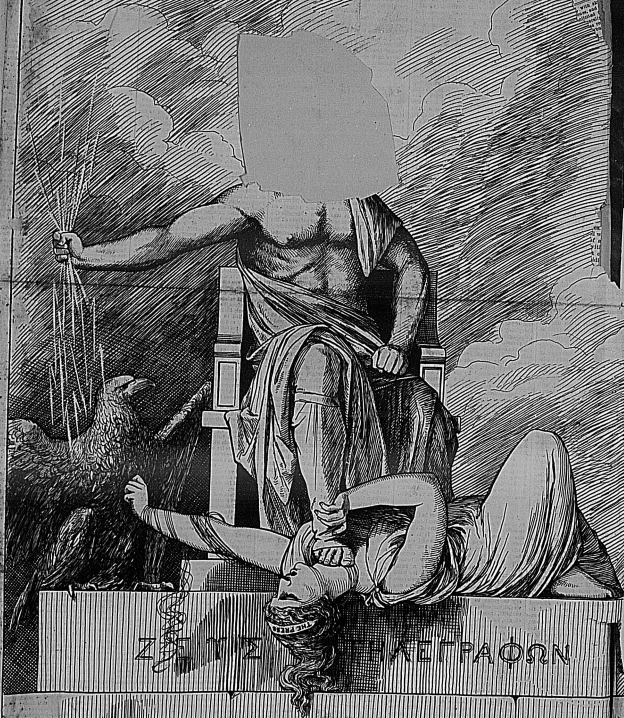


A black and white illustration of a cat lying on its back, surrounded by various objects. A large, stylized flame or smoke plume rises from the left. A wooden crate or box is visible in the upper right. Several small items, possibly coins or tokens, are scattered around the cat, some labeled 'PACIFIC' and 'PACIFIC'. The cat's face is obscured by a large white oval. The illustration is signed 'J. H. H. 1891' in the bottom right corner.

THE WILY MONKEY AND THE DELUDED CAT.

THE WILY MONKEY AND THE DELUDED CAT.

A wily monkey, named Jollyo Gaid, wishing to secure for himself some chetivats, that others had placed to be roasted, said to the house cat Jennings-Jewee-Heed: "I will come and wait near those stoves I will then give you some milk." The cat was well pleased at the offer, and went off to get some milk from the owner of the stove and brought it back. Presently, with Tabby's paw which thus was secretly lured—Jollyo pulled out the stew. He saw poor Tabby the milk; but people ate the meat, it was Tabby who was the thief; she limped over backwards, and everybody laughed when he thought of that howl about the immorality of the owners of the

RAP
MARCH

ΖΕΥΣ ΑΜΜΟΠΟΛΙΣ

ΚΑΙ ΚΤΕΙΝΩΝ

"CREDO"
"I BELIEVE IN
THE PROFITS
AND IGNORE
THE LOSSES."
Per. Rec.
ST. JAY GOULD



ST. JAY GOULD IN MONASTIC RETIREMENT.

"In seclusion's sad cell
He looks of Wall street dwell;
He sees his golden head;

"Here retirement on the end
Of life's prime, he sits his friend.
He sees his golden head;
Here are covered all his "shares."

"Now in heavenly state he "pays"
All his loans. "The spirit says."
"Here may power and little may lose."
"Tempore, his credit is sold in loss."

...and the treatment of the disease.

...ing by. I often discussed the

Test with Student

METALLIFEROUS DEPOSITS IN ALTAI, CHINA.

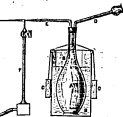
M. BERNHARDT DE COSTA has made a study of the metalliferous deposits of Altai. These are, in fact, extremely numerous, and the most important of them are found in the western part of the Altai, in the neighborhood of Chokan, Khatanga, and Khatanga. The most important of these are, however, those which are also in the eastern part of the Altai, in the neighborhood of Chokan, Khatanga, and Khatanga. The eastern part of Altai is the most important, and the most important of these are, however, those which are also in the eastern part of the Altai, in the neighborhood of Chokan, Khatanga, and Khatanga.

All the metalliferous deposits at present known here, as M. de Costa observes, contain certain characteristic elements, and these are, in fact, the same in all the deposits. They are generally inclined to paleo-Asian, belonging to the Silurian, the Devonian, and the Carboniferous series. In fact, in the Altai, the most important of these are, however, those which are also in the eastern part of the Altai, in the neighborhood of Chokan, Khatanga, and Khatanga.

The metalliferous deposits of Altai are extremely rich in copper, copper, and metallic iron, but these are not the only elements which are found in the deposits. They are, in fact, the same in all the deposits. They are generally inclined to paleo-Asian, belonging to the Silurian, the Devonian, and the Carboniferous series.

THE QUADRUPLUX TELEGRAPHIC APPARATUS.

THE QUADRUPLUX TELEGRAPHIC APPARATUS is a new and improved system of telegraphy, which is capable of transmitting four messages at the same time. It is a very simple and easy to use, and it is a very important invention.



being placed in any suitable vessel B, three feet in diameter, and a height of six feet. The water in the vessel is kept at a constant temperature, and the water is kept at a constant temperature. The water is kept at a constant temperature, and the water is kept at a constant temperature.

THE QUADRUPLUX TELEGRAPHIC APPARATUS.

A LETTER FROM MR. GEORGE LITTLE ABOUT HIS DISCOVERY.

TO THE EDITOR OF THE TRIBUNE.
SIR: As the inventor and proprietor of the "Quadruplex Automatic Telegraphic Apparatus," I have the honor to acknowledge the receipt of your letter of the 10th inst., and in reply to inform you that the same has been forwarded to the proper authorities for their consideration. I am, Sir, very respectfully,
Yours truly,
GEORGE LITTLE.

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Philadelphia, March 10, 1875.

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Philadelphia, March 10, 1875.

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Philadelphia, March 10, 1875.

Philadelphia, March 10, 1875.

Philadelphia, March 10, 1875.

NEW YORK.



10

T. G. MURRAY

W. WILSON

York Calcium Light Company
Manufacturers of
CALCIUM LIGHTS.

PRICE LIST No. 1.

GEORGE WALE & CO.,

(Formerly HAWKINS & WALE)

Philosophical Instrument Makers

TO THE
Stevens Institute of Technology,

HERKEN, N. J.

SPECTROSCOPES, MAGIC LANTERNS, AND ATTACHMENTS.

Using supplied instruments on the following institutions and individuals, they would refer to the same as regards workmanhood, etc.

Prof. H. S. KARNER, Ed.,
Prof. T. S. MURPHY.

with *U. stans* Naval Academy, Annapolis;
Lieut. JOHN FARRINGTON, Prof. of Mechanics.

Dr. CHARLES F. CHASEMAN,
Dean of School of Mines.

Dr. C. A. Sore, Prof. of Chemistry,
Prof. T. H. Koster, Prof. of Mineralogy,
and University, Albany, New York:

Wm. A. Anderson, Prof. of Physics,
Columbia Univ., New York:

Wm. A. ANTHONY, Prof. of Phys. and Mech.

J. W. MONTGOMERY, Prof. of Physics,
Dr. FRED. THOMAS, JR.,

Prof. of Min. and Mining.
 Polytechnic University, Belgrade, Ser.
 Prof. of Chemistry.

Dr. H. W. FRAZIER, Prof of Min. and Metall.

The field is strongly tilted, free of stress, Osm. 7
C. H. LEMAS, Prof. of Physics.

Dr. R. H. Dornbush, Prof. of Chemistry.

University of Pennsylvania, Philadelphia, Pa.
 DR. G. F. HUNTER, Prof. of Physics.
 Cornell Univ., Ithaca, N. Y.

C. A. FARRER, Prof. of Physics,
Hinkleyton Laboratory, R. Inst., No. 1
St. Ann's Road, of Physics.

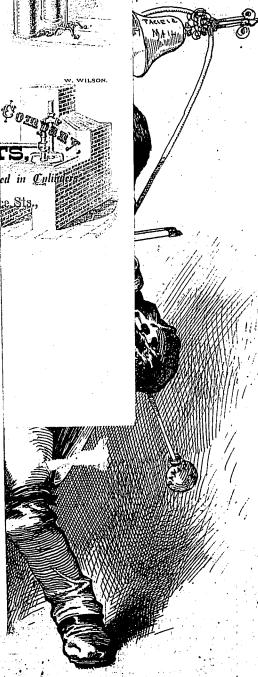
Wm. H. PONTON, Prof. of Theology,
Northwestern University, ELL

Prof. R. P. DODDERS,
University of Minnesota, Minneapolis.

See Park Medical Center:
Dr. HENRY SWAFER.
Dr. CHARLES F. WEST.

Brooklyn Heights Seminary, Brooklyn, N. Y.
Mr. THOMAS H. HARVEY.

REG. EXCHG. LEIBNIZ.



THE WALL STREET ORPHEUS.

Old Orpheus with his merry tone
Made nimble kins of stork and stone;
Our Orpheus, more to profit prone,
Plays to the dance of stock alone.

\$225.00
75.00
35.00
25.00
15.00
14.00

\$50.00 a pair
75.00 "
20.00 "
40.00 "

the factory.
g to size.

20c a foot
3 " "
20 " "

\$1.10
.40
.30
.30

FACT.

ematic foun.
nt apparatus.



THE WALL STREET ORPHEUS.

Old Orpheus with his merry tone,
Made nimble knee of stock and stone;
Old Orpheus, more to speak good,
Plays to the dance of stock alone.

Automatic Transmission.

We now proceed to consider some of the principal causes of delay which occur in working the pneumatic tubes, arising from accident or disorganisation. The first of these causes which we select for notice is due to a train stopping in the tube. An event of this nature may arise either from an accident to the train, to the tube, or to the adjacent station apparatus. In such a case the delay is generally very brief, and it is generally sufficient to reverse the pressure on the train by forcing air through it from the next station, care being taken to introduce a piston which drives back the train to the place whence it started.

[illegible]

Several apparatus have been designed for recording the exact position of a stoppage in the tube. Fig. 27 shows one of these, the invention of M. Honoré. The piston unrolls a thread a, b, c , which passes from T over the pulley S. The quantity of thread which remains in the tube behind the piston is measured by the counter V, which is connected with the drum S. The thread being guided, and remaining always in tension, it is inferred that the length unrolled should always represent exactly the point of the obstruction. Experience of this apparatus has not yet been obtained.

We turn next to a process which is fully the adaptation to the special end in view of M. Heynath's experiments to determine the velocity of sound in tubes. The originality of these experiments rests entirely in the mode of observing and recording the sound wave, on its arrival at the end of the tube. M. Heynath constructed an artificial ear with a membrane of cellophane, but far more sensitive than the human eardrum. When such a membrane is inflated by the impulse of a sound wave, the electric thin process can be utilized. Close an electric circuit, and this means records the exact position when the sound reached its destination. The arrangement of this membrane is very simple, and is shown in Figs. 93, 92. A thin leaf of slightly-vulcanized rubber, A, is selected, and secured between two metal clips, connected by screws which

through the surface located in the rubber. A small metal disc is cemented to the centre of the cathode tube, and above this is a pointed screw D. An electric circuit is closed when C and D come in contact by the inflation of the membrane. This latter controlled by a syringe, is placed at the free end of the tube, so that the successive impulses can be registered on a revolving cylinder by means of an electric current. A sawtooth produced in this type of firing is plotted in Fig. 1.

The cathode is placed at the second of 250 struts per second, and strikes against the obstruction, from which it is reflected, and traverses the tube in the opposite direction, inflating the membrane. By this means a first inflation is marked on the record.

first and second indication be accurately recorded it is easy to calculate the distance between the microtransducer and the obstruction. The chronograph which is employed is furnished with three timing points; the first of these is placed in the circuit which is closed by the successive pulsations of the microtransducer, the second corresponds to the electric regulator, making periods of seconds in the cylinder, and the third indicates the second intervals by means of an electric vibrator. Fig. 109 is an example of the kind of result made. The obstacle is situated at the tube at a distance of 53 meters and the vibrator marks thirty-three oscillations per second. The interval occupied on the band of paper on the cylinder, by two consecutive marks on the same tube, corresponds to twelve oscillations

through, but an instance has been known in which a dispatch remained several days in the tube before it was carried forward to the adjacent station.

2. *Flighting a Train*.—This appears almost incredible; but such a thing has occurred, through carelessness on the part of the operator, in giving the *Frederick* signal before the arrival of the train. In one instance to which we may especially refer the signal for a clear line having been given although a train remained in the yard, a second train was dispatched without the first train on to the delivery siding, and the first train was then on to the delivery siding and remained behind; a third and fourth followed, each being mistaken for the first, and so on throughout the day, the accident having been discovered only in the evening.

3. *Packing a Piston.*—The packing is fixed to

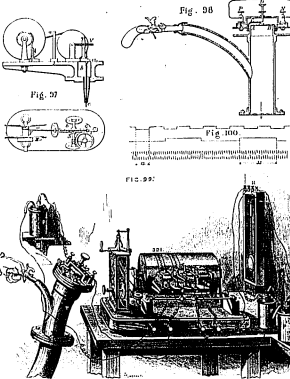


Fig. 37

Fig. 10

FIG. 22

The distance of the obstacles is then calculated by the following formula: $D = .5 \times 330 \times \frac{10}{33} = 60$ metres so that the figure recorded by means of the rubber diaphragm approximates to the actual distance.

Mr. Skene prefers to ascertain the position of an obstacle by filling the tube up to the point of obstruction with water. This ought, with careful measurement of the water, to give the exact position, but the method is somewhat primitive. It will be of interest to notice some causes of accidents that have actually occurred.

1. *The accidental Stowage of a Pistol to the Train.*—In such a case the air acts directly on the carrier and forces them apart in such a manner, that the arrive at their destination one after the other, either complete or with the cover removed, and with portion of the despatches left behind. The fol-

piston by means of a screw rod, as already described. On one occasion, during a severe frost, the train stopped, and the whole of the piston directly frozen hard and fast. Considerable difficulty was experienced in freeing the tube. Several pistons were filled with hot water, and directed after the other at the obstruction, which gradually yielded, and was forced forward to the adjacent station. The screw, however, remained behind, and to recover it, another piston was sent through the tube at a very low speed, a manoeuvre which succeeded perfectly.

4. *Accidents to the Tubes.*—Often the tubes are under the streets in positions where they are not frequently disturbed owing to repairs, &c., of gas and gas mains, or even where they are exposed to shocks in the course of street surface repairs. Under such conditions the tubes may be broken or distorted in form, and in either

ch cases the traffic must
age is discovered and re-
ation a cause that has not
age and delay. This is the

... or of special trains for
... in order to clear it of
... that unavoidably
... like the piston to fit
... with great discretion, as
... jammed, and so ob-

transmission from the above, or various, every effort has to be made to deliver the message at hand as soon as possible, but to prevent to the detriment of business. The following are the cases. During the last year, the following cases have been reported:

Since only two stations in
vice is organised, at fifteen
convey the trains over the
the least possible waste of
is less than a quarter of an
time is of little consequence.
united, the national system

ect by an example, we may
page 102, where we will
occur on line 8-11. It is
requirements of the stations

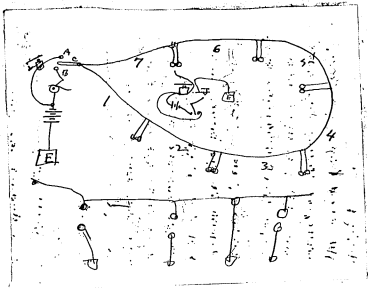
the centre O, and between
of the following systems of
13-12, 12-11.
14-O; O-3,
the stations 8 and 11, and

11, will
ity twice
ured in
the extra

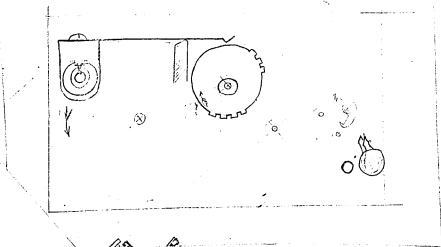
so that
from the 8
minute in-
e may be
principal
x system

regular delivery intervals
from a
greater
range of
both directions

and afford protection in case of an emergency.



Original idea of Edison for test stations & instruments
for domestic tel co New York & from which I designed the
wiring Batchelor
given to me June 27th 1875



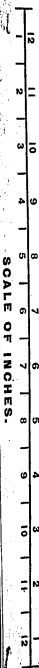
First sketch of repeater for domestic tel co system
of F. M. Allen from Edison's ideas & from which the
working drawing was made.
Batchelor

[illegible]

[illegible]

CASH TARIFF
THE DOMESTIC TELEGRAPH CO.
MESSENGER SERVICE.

CASH TARIFF
THE DOMESTIC TELEGRAPH CO.
MESSENGER SERVICE.



SCALE OF INCHES.

[illegible]

District No. _____
Street. _____

New York, 187

M _____

To THE DOMESTIC TELEGRAPH CO., Dr.
General Office, 12 Vesey St.

To Messenger or Police service from _____ to _____

To rent of Signal Instrument, from _____ to _____

Vouchers Ret'd.

Received Pay for The Domestic Telegraph Company,

By _____

N. B.—If found correct, please call a Messenger and pay this bill. No charge being made for such service.

Paid by Proc. 145 25 26 May to June 20

C. J. OSBORN & Co.,
BROAD STREET,

By Telegraph from _____

New York, May 30 1875

To _____

118 P

118 B. 118
When will you have my
stock for station instrument
ready?

118

NOTICE

Will be given WHEN this Instrument
is READY for use—and until
such time please

NOT DISTURB IT.

Respectfully, &c.

12 Vesey Street.

THE DOMESTIC TEL. CO.

The Automatic Fire-Alarm Telegraph.
The efficiency of fire as an automatic telegraph
operator was officially demonstrated at the fire
which occurred on Sunday morning at 11 and
120 West street. At 7 o'clock, A. M., an auto-
matic dispatch was received at the Murray street
fire house patrol station, giving notice of a
fire in the building at the West street build-
ing. The patrol responded, immediately,
and reached the building within three
minutes after receiving the alarm, but
finding that the fire was obtaining rapid
headway the patrol called the Fire Department
to their assistance. A second alarm was re-
ceived at the patrol station from the basement of
the building, at five minutes past 7 o'clock A. M.
Owing to the peculiar nature of the combustion—
(wooden case), the fire had developed in
considering for some hours before it broke
into a flame that evolved sufficient heat to
ignite the gas in the building, and, thereby,
causing the alarm. It is only necessary
to say that this timely service was per-
formed through the agency of the Domestic
Fire-Alarm Telegraph system, which communi-
cates with the firehouse patrol and indicates the
exact location of a fire and the exact locality
in the building where it is burning. We have
been so well convinced of the utility of this sys-
tem that we have had it applied to the new build-
ing at the River View. Not only will a fire
in this building be confined to the apartment
where it originates, by the Government utility of
the building, but the alarm will be given almost
instantly after the fire breaks out, and the
damage to furniture, books, door openings,
&c. will be prevented.



ON WANTED FOR A PROT

The second point—the experimental trials—

to Mr. Trench, who has had the pleasure of carrying out
of the works under the above gentlemen. The first

Under the above name on Wednesday last.

The first point—the manufacture—proved very

FEB 5 1976

The second school of experimenters measured the strength of the powder, and concluded first

broke the rail into four pieces, allowing the ends to snap. In military work, the first ill-

مستند

100

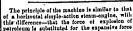
1990

1

Envi

TH**ERE** has recently been constructed at Vienna a petrol-driven motor for small industries. Its first application to saving gasoline is said to have given such good results as to call forth a large number of orders.

The enclosed cut (which we copy from the *Giorno di Industrie*) will give some idea of this motor.



The petroleum is introduced into the cylinder simply by atmospheric pressure, and in consequence of the vacuum which the piston makes in advancing. The impulsion of the flywheel brings the piston back again. The air is constantly renewed in the bellows E by a tube K.

To cool the cylinder, a current of cold water is made to circulate between the envelopes; being warmed from the surface T, for the reason,

The petroleum motor is constructed with forces of from 1 to 3 horse-power; for a machine of 1½ horse-power the price is \$2,600.00, including the foundation-plate and the water-pump. The expense of mounting is small.

...the

© 2000 Blackwell Science Ltd *Journal of Internal Medicine* 247: 111–117

He. A new wrinkle in this sort of litigation, and a new direction for appeals, has lately appeared, which seems to indicate that the time has come when Congress should, by the adoption of wise legislation, put an end to this waste of time and money. Among other duties of the Secretary of the Interior, he is required to sign all patents after they are prepared, passed, and approved by the Commissioner of Patents. On a recent occasion, when the Commissioner, after a long and full argument of the matter before him, had decided the case of Pea-

consideration. If one dissatisfied applicant may thus occupy the secretary's time, all applicants ought to have the same privilege. If the secretary may nullify one legitimate decision of the Constitutionalists of Palestine, he may nullify all. The money costs of this one litigation before the commission and the secretary are stated to have reached, at the present time, over fifty thousand dollars. Jay thought, it would, in an interested party on the one side, and the Western Union Telegraph Company on the other. Jay is doing all he can to insure the Western Union Commission be made an

Patent office to the precept issue of a patent to every applicant whose papers are presented in proper form. It is alleged by the advocates of the American system that, if one official examination and Patent-office wrangles were abolished, then the courts would be overwhelmed with patent litigation. But the experience of other nations shows that enough results would ensue. In England, as before stated, they have only eight patent litigations before the courts per annum; while in France, Belgium, and other countries, where no official examination and no Patent-office litigations take

small, see number of insects same brought before the courts is very small.—*Scientific American*.

100

IT C. HOCKEY

It would be surprising to give instances, when within the last few years the use of these instruments might have brought about the most important results.

*Head before the Society of Telegraph Engineers.

In a few minutes. When the exact position of the distant station is not known, a flash of sunlight must be thrown in the direction of the most likely points, and this must be continued until it is answered by a flash, which indicates that a distant signalling party is on the look-out. Then, after

The spot will be observed gradually to rise or fall, according to the direction in which the sun is apparently moving. The handle of the key, or the tangent arrow, or both, as the case may be, must be turned slightly after every two or three words, to insure, as far as possible, that the center of the spot shall be on the steel when the key is released.

the silhouette of working the instrument: after four days, in experienced hands, twelve words per minute have been obtained, while others estimate that men—after a fortnight's practice—obtain only from four to five words per minute. At the distance, 10 and 20 miles—and in very clear

A number of officers of the Indian Army have tried and reported upon the instrument, and—with the exception of one—all report most favorably the system as an auxiliary to existing systems, and efforts are being made at the present moment to insure their adoption for the Indian Service by the authorities.

At the ordinary meeting held on Monday night, Society, showed an object of which was harmonic analysis. Committee of the H. prediction of tide, a plate analysis that showed made an excellent series of ten pulley motion, while the These gave the side, with their part of the circular a chain, one of off ing in a geometrical in curves upon a re in the instrument

stabilized, and result gave marks which at different points of the time. Formerly the times but the tide-calculations at every moment of course could either be sailor, or if it numbers could be obtained for general. Mr William also if you had been interested of the ordin

ated the imperfect
fitted to show the
subsequent win-
cuss with super
mons sheet of pap
alone was drawn o
re for any other
formally, 17 in. x
to 1 in. for the 21
——————

to mark time on
social motion of
earn every hour.
expedient, certis
under his observa
otherwise. A rot
size for his inter

further of the
conductivity of
the earth
depending (all, pp. 1
seems to take great care
in showing for any case
of electrolysis is influ

The source of electrons used by the authors is a coil of wire 200 to 300 turns in diameter of employing a system to control the polarization. The results obtained are discussed and the authors conclude that the method is suitable for the study of the polarization of the electron beam.

of experiments with a 6 deg., 18 deg., and 30 deg. was investigated at concentrations varying from 0.01 to 0.1 mole/l. of photo saturation. For 0.01 mole/l. it was found that the temperature, the rate of reaction was nearly constant, the reaction rate which is 47% at

...tremely great as a
of a total or the
remains constant, the
the percentage stream
and magnesium, how
of Ca the having a
26 per cent. of salt,
120 per cent. Nitro
...purity 1-10

Engine

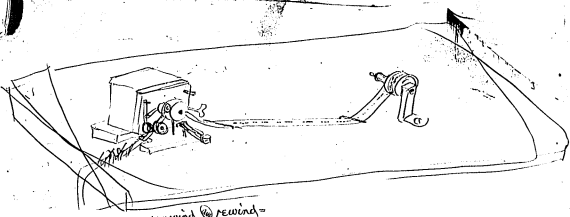
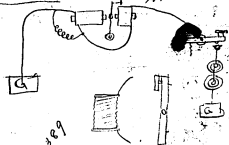
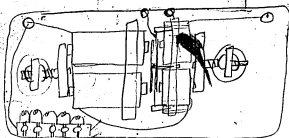
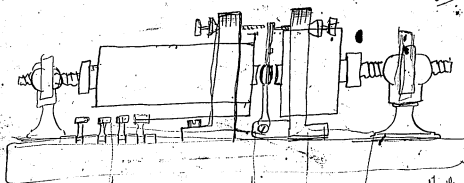
which is filled with a warm and acrid liquid. The words, are then released through the latter in the trough. The company with earth. The company is perfect tranquility.

or duty. A telegram
on the shore plan, has
said in his summary
that the method of lay

B

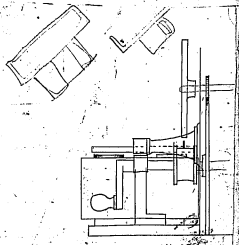
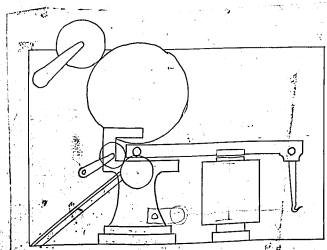
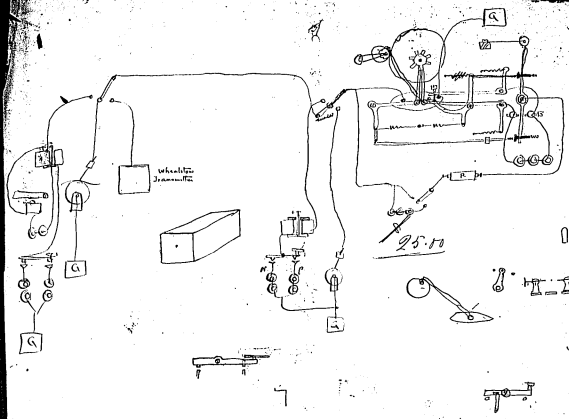


Mo
Aut

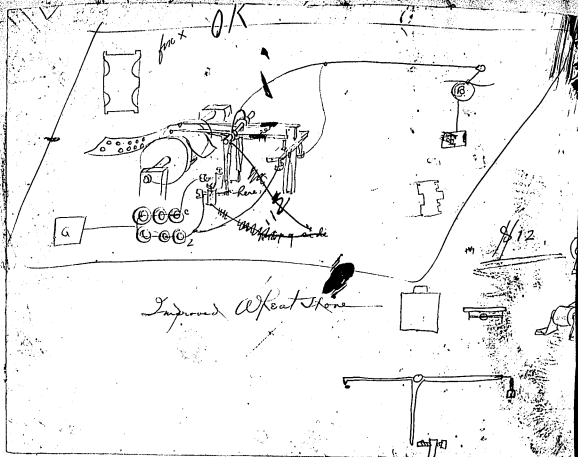


98

Model



23



Daily Report of Sets of Southern Wires made at New York, N.Y.

187

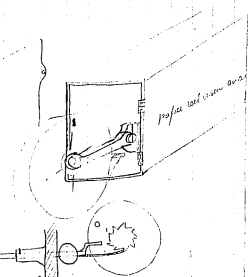
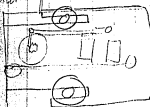
DESCRIPTION OF WIRE.	Number of Reps. in Set.	Span, in feet.	Length of Wire, in feet.	WEATHER.	TEMPERATURE.	Direction of Current.	Direction of Wind.	Direction of Tide.	Direction of Current.	Direction of Tide.	Direction of Current.	Direction of Tide.
1. Washington.	1	1	1	1	1	1	1	1	1	1	1	1
2. Philadelphia.	2	2	2	2	2	2	2	2	2	2	2	2
3. Washington.	3	3	3	3	3	3	3	3	3	3	3	3
4. Philadelphia.	4	4	4	4	4	4	4	4	4	4	4	4
5. Washington.	5	5	5	5	5	5	5	5	5	5	5	5
6. Philadelphia.	6	6	6	6	6	6	6	6	6	6	6	6
7. Washington.	7	7	7	7	7	7	7	7	7	7	7	7
8. Philadelphia.	8	8	8	8	8	8	8	8	8	8	8	8
9. Washington.	9	9	9	9	9	9	9	9	9	9	9	9
10. Philadelphia.	10	10	10	10	10	10	10	10	10	10	10	10
11. Washington.	11	11	11	11	11	11	11	11	11	11	11	11
12. Philadelphia.	12	12	12	12	12	12	12	12	12	12	12	12
13. Washington.	13	13	13	13	13	13	13	13	13	13	13	13
14. Philadelphia.	14	14	14	14	14	14	14	14	14	14	14	14
15. Washington.	15	15	15	15	15	15	15	15	15	15	15	15
16. Philadelphia.	16	16	16	16	16	16	16	16	16	16	16	16
17. Washington.	17	17	17	17	17	17	17	17	17	17	17	17
18. Philadelphia.	18	18	18	18	18	18	18	18	18	18	18	18
19. Washington.	19	19	19	19	19	19	19	19	19	19	19	19
20. Philadelphia.	20	20	20	20	20	20	20	20	20	20	20	20
21. Washington.	21	21	21	21	21	21	21	21	21	21	21	21
22. Philadelphia.	22	22	22	22	22	22	22	22	22	22	22	22
23. Washington.	23	23	23	23	23	23	23	23	23	23	23	23
24. Philadelphia.	24	24	24	24	24	24	24	24	24	24	24	24
25. Washington.	25	25	25	25	25	25	25	25	25	25	25	25
26. Philadelphia.	26	26	26	26	26	26	26	26	26	26	26	26
27. Washington.	27	27	27	27	27	27	27	27	27	27	27	27
28. Philadelphia.	28	28	28	28	28	28	28	28	28	28	28	28
29. Washington.	29	29	29	29	29	29	29	29	29	29	29	29
30. Philadelphia.	30	30	30	30	30	30	30	30	30	30	30	30
31. Washington.	31	31	31	31	31	31	31	31	31	31	31	31
32. Philadelphia.	32	32	32	32	32	32	32	32	32	32	32	32
33. Washington.	33	33	33	33	33	33	33	33	33	33	33	33
34. Philadelphia.	34	34	34	34	34	34	34	34	34	34	34	34
35. Washington.	35	35	35	35	35	35	35	35	35	35	35	35
36. Philadelphia.	36	36	36	36	36	36	36	36	36	36	36	36
37. Washington.	37	37	37	37	37	37	37	37	37	37	37	37
38. Philadelphia.	38	38	38	38	38	38	38	38	38	38	38	38
39. Washington.	39	39	39	39	39	39	39	39	39	39	39	39
40. Philadelphia.	40	40	40	40	40	40	40	40	40	40	40	40
41. Washington.	41	41	41	41	41	41	41	41	41	41	41	41
42. Philadelphia.	42	42	42	42	42	42	42	42	42	42	42	42
43. Washington.	43	43	43	43	43	43	43	43	43	43	43	43
44. Philadelphia.	44	44	44	44	44	44	44	44	44	44	44	44
45. Washington.	45	45	45	45	45	45	45	45	45	45	45	45
46. Philadelphia.	46	46	46	46	46	46	46	46	46	46	46	46
47. Washington.	47	47	47	47	47	47	47	47	47	47	47	47
48. Philadelphia.	48	48	48	48	48	48	48	48	48	48	48	48
49. Washington.	49	49	49	49	49	49	49	49	49	49	49	49
50. Philadelphia.	50	50	50	50	50	50	50	50	50	50	50	50
51. Washington.	51	51	51	51	51	51	51	51	51	51	51	51
52. Philadelphia.	52	52	52	52	52	52	52	52	52	52	52	52
53. Washington.	53	53	53	53	53	53	53	53	53	53	53	53
54. Philadelphia.	54	54	54	54	54	54	54	54	54	54	54	54
55. Washington.	55	55	55	55	55	55	55	55	55	55	55	55
56. Philadelphia.	56	56	56	56	56	56	56	56	56	56	56	56
57. Washington.	57	57	57	57	57	57	57	57	57	57	57	57
58. Philadelphia.	58	58	58	58	58	58	58	58	58	58	58	58
59. Washington.	59	59	59	59	59	59	59	59	59	59	59	59
60. Philadelphia.	60	60	60	60	60	60	60	60	60	60	60	60
61. Washington.	61	61	61	61	61	61	61	61	61	61	61	61
62. Philadelphia.	62	62	62	62	62	62	62	62	62	62	62	62
63. Washington.	63	63	63	63	63	63	63	63	63	63	63	63
64. Philadelphia.	64	64	64	64	64	64	64	64	64	64	64	64
65. Washington.	65	65	65	65	65	65	65	65	65	65	65	65
66. Philadelphia.	66	66	66	66	66	66	66	66	66	66	66	66
67. Washington.	67	67	67	67	67	67	67	67	67	67	67	67
68. Philadelphia.	68	68	68	68	68	68	68	68	68	68	68	68
69. Washington.	69	69	69	69	69	69	69	69	69	69	69	69
70. Philadelphia.	70	70	70	70	70	70	70	70	70	70	70	70
71. Washington.	71	71	71	71	71	71	71	71	71	71	71	71
72. Philadelphia.	72	72	72	72	72	72	72	72	72	72	72	72

REMARKS AS TO THE WEATHER, if any, state
the direction of the wind, the force of the current,
and if the water is sea or calm, and if the sky is
clear or cloudy.

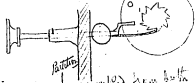


Make frame work to be taken out the way

Sep 24 1895
Bachman



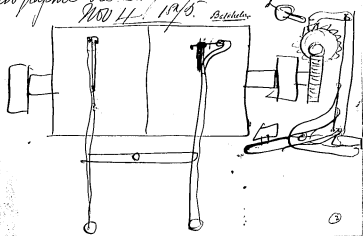
Has to be put in front
of paper hole to prevent
the paper coming down.
which would be taken
out - guard behind it
prevent suspension from
coming down it a little child



Division can be worked from both ends

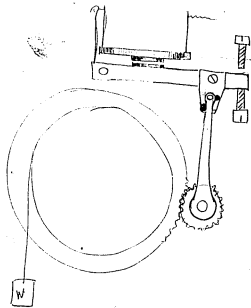
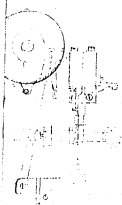
APPROXIMATELY 1/2 INCH

Chirographic Ill. Experiment
Nov 14 1895. Bachman



25

23



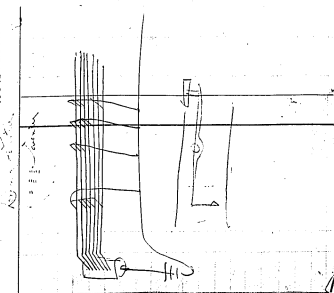
No 2

NEW YORK, N. Y.

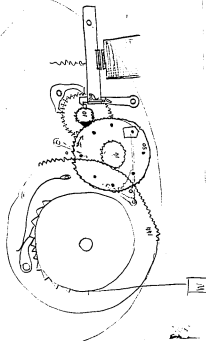
1897

To EDISON & MURRAY.

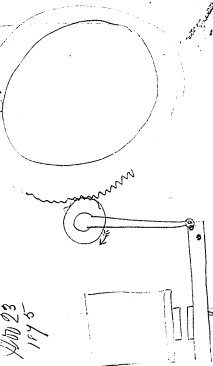
MANUFACTURERS OF
Telegraph Instruments,
10 & 12 Ward Street.



Eng. sketch
W. W. 23
1895
This was drawn about
Aug 20th
1895
G. W. C. S.

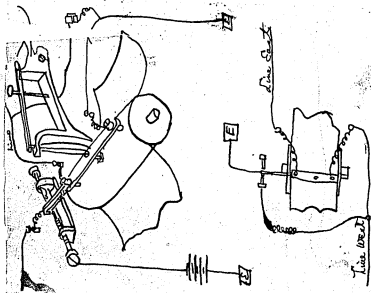
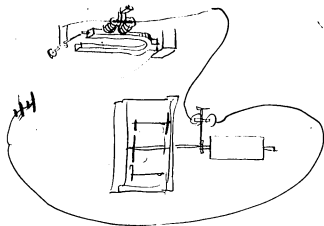


This was drawn about Aug 20th
1895
G. W. C. S.

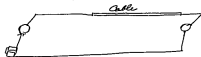


Paine's Electric Engine

About a year ago Mr Henry M Paine
 startled the ~~total~~ scientific world by announcing
 through the Columns of several journals
 the discovery of a powerful Electromagnetic
 Engine whose power exceeded that
 of Steam.



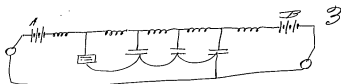
try this. Cable experiments. No. 1



try this.



2.



10 cells each. Turn a given speed each,
then disconnect A & add to B & make
20 cells in B (note difference).
4 Condensers

①

Newark, N. J.,

187

Mc

Bought of EDISON & MURRAY,

MANUFACTURERS OF

Mirror Galvanometers,
Resistance Coils,
Condensers,
Submarine Keys.

g

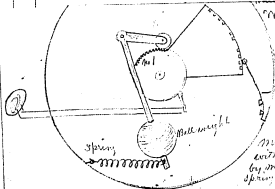
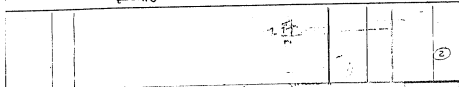
Induction Coils,
Differential Galvanometers,
Electrometers,
Simon's Ink Recorder.

Moving Galvanometers,
Secondary Batteries,
Polarized Relays,
Morse Registers.

Morse Keys,
Morse Senders,
Photocathode App.
Learners-Recording Instrs.

10 & 12 Ward Street, Newark, N. J.

10



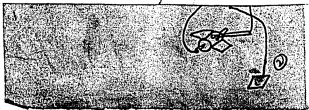
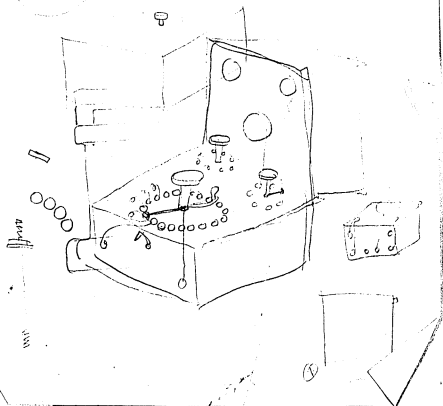
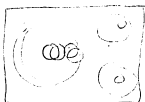
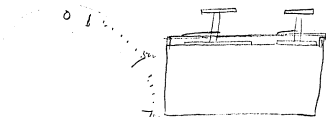
"rod" Celluloid
Bases &c

see also

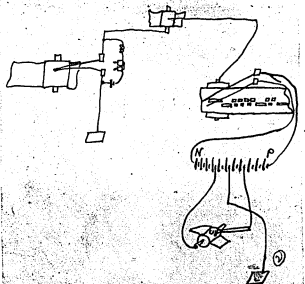
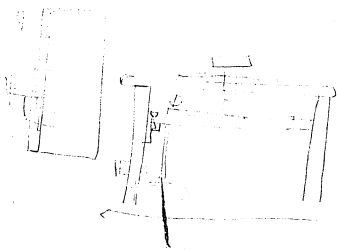
③ P. 32, no. 2.

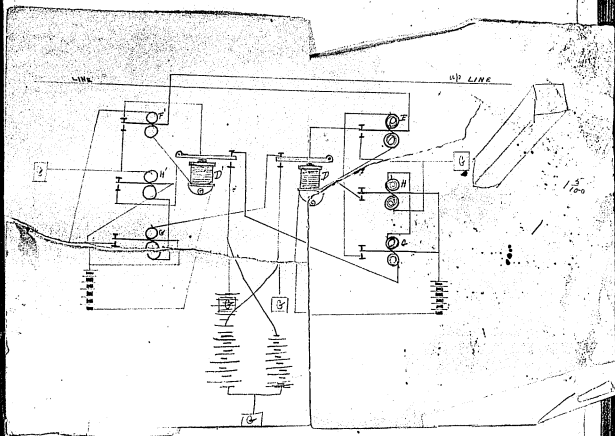
Might work better
with a ball weight
by means of adjustable
spring also with screw

Now would with copper wheel o's
for friction with rough drum surface

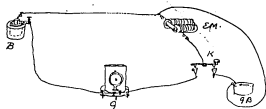


O 1





Feb 21. 1874.

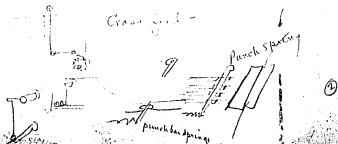


B is a single Daniel cell, G a mirror galvanometer with K a key with double contact points EM is the long Electromagnet, 9B a Bradley Galv on No 1 Coil, press Key down & wait for 5 or 10 seconds then open & close as quick as possible, (very quick) If the Mirror Don't move perceptibly, and 9B Does Then Smash goes Modern theories, The magnet must be quite long and lots of fine wire on it otherwise you will not be able to work the key quick enough to prevent the Mirror working. The armature on EM should be permanently attached, so as to increase the inductive Effect — ①

Try this.

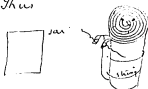


Circuit as follows.



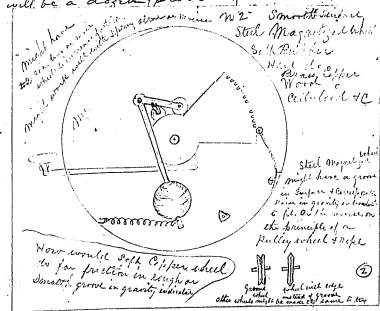
① Battery Hook 17 Feb
14 Feb. 1874

Batch make a secondary battery of one of the large Blue vitrol battery jars and sheet Copper Thus



These parallel sheets of Copper are nearly as high as the jar about $1\frac{1}{2}$ inch from edge. They are coiled together about $\frac{1}{4}$ inch apart and may be separated with sticks of wood every 3 inches and then securely bound together with stout marlin so that the two plates cannot possibly touch. Even with rough handling, I wish to ascertain the amount of charge & discharge this will show for a Bridge as well as the length of discharge. if valued as a very J.C. Reiff ①

Continued
p. 36.



Claim this

See 4th

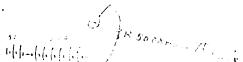


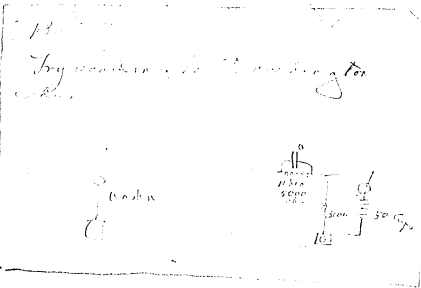
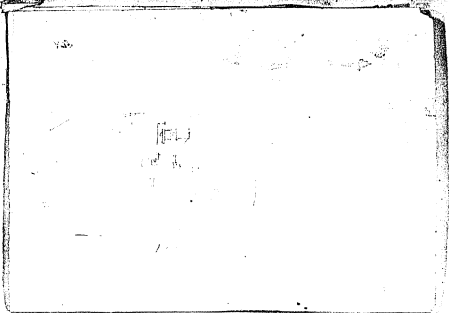
181. in Continuation with chimney
 number page of 2 a little lower
 it not



700000

a 600

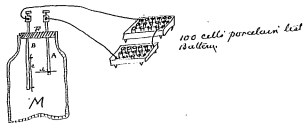




Nov. 22 1874

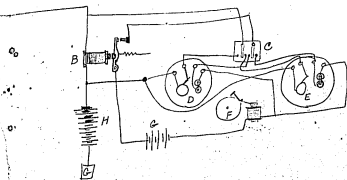
Experiment No. 1.

To determine whether any electricity 'pass' from one pole of a battery of 100 elements to the other when separated—a slight distance,

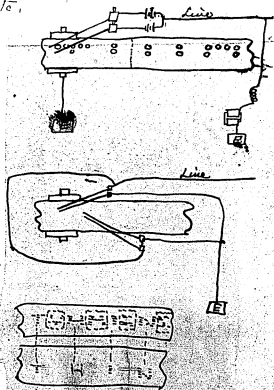


M is a clean dry Candy Jar P is a tight fitting Mulehide or Hard rubber top, well secured in the jar with plenty of beeswax so that not the slightest trace of air can get within or out. A B are two brass rods B has two metallic projecting pins on which is secured a strip of chemical paper two inches long moistened with a solution of Iodide of Potassium. And Starch. [1 grain starch 2 of distilled water $\frac{1}{4}$ of Iodide potassium.) A is another rod having a platinum wire facing the Iodized slip C coming within exactly $\frac{1}{16}$ of an inch from it - These two rods project out of the

jar for distance of four inches.



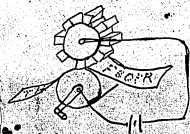
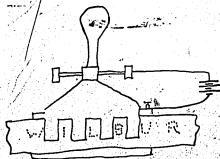
Cover and end in Binding posts. These rods
 should be as far apart as possible, They are
 Connected with 3 trays of the test battery
 and placed on a table, The hint if any
 should be noticed and noted as well as the
 time when the battery is first connected
 The first hint should be noted and the
 time taken when it shall have assumed a
 depth equal to the first hint on the Chromatic
 scale shown in box work on Orgone
 should there be a hint it will prove first.
 That the particles of air are conductors
 for Dynamic or Voltaic Electricity of low
 tension and corollary that induction is the
 effect of conduction the reflecting effect being
 only produced by polarization be encompassing
 E.M.F. Secondly that Sodium of pot or any
 other Chemical Compound that is decomposable
 by Electricity are very unreliable tests;
 for Orgone - etc.

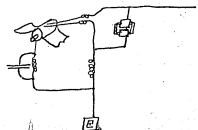
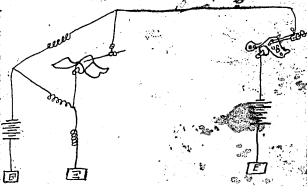
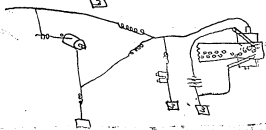
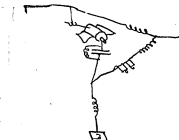
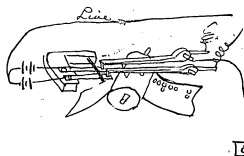
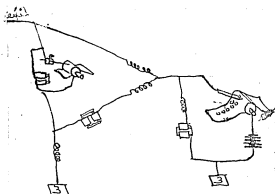
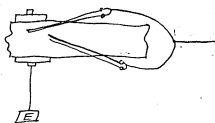


along the line, I expect if these batteries are placed on the line 30 miles apart that they will generate (from the addition of the brass melting battery) as much Thomson Charge as that due to the line itself being the case the plate charge of the line will be exactly compensated for and any speed on any circuit may be obtained — Book it =

Make a coil of that Galva pascha wire (small) with perfect insulated joints & coil it on a magnet (C) two large relay coils so that it will take up about same bulk as if I hadly spoke wire. I want to insert it in the legend of a battery the current of which passes through the Galva pascha wire also: wind the outside of a Bichromate battery for 5 or 6 layers of ordinary relay wire — work to see if when I close the current of the battery there will be induction in the wire —

Charge an insulated secondary battery box with the 8 battery by connecting the prime conductor on one end of the plate glass machine to one end battery & the prime conductor to other end & turn for 5 minutes, then with with insulated key throw battery on. Bradley gal glo insulated =





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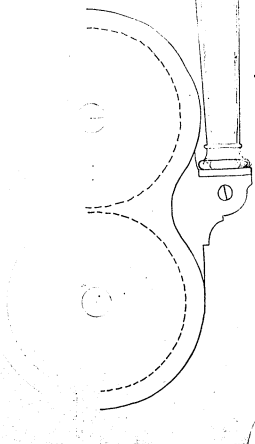
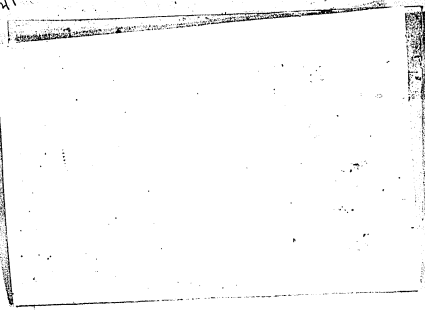
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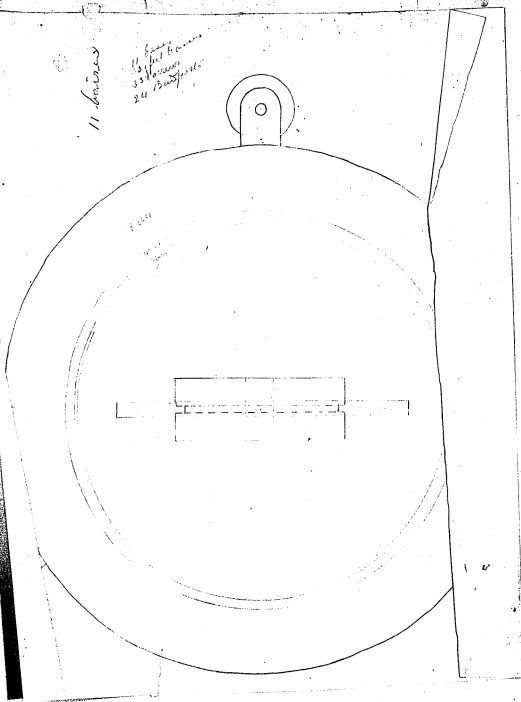
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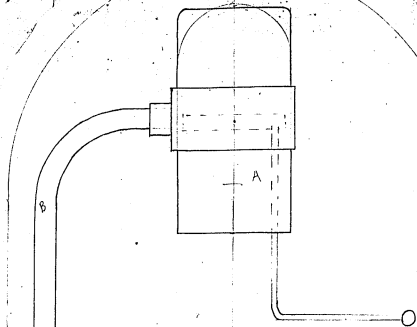


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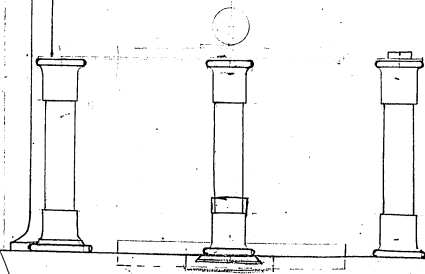
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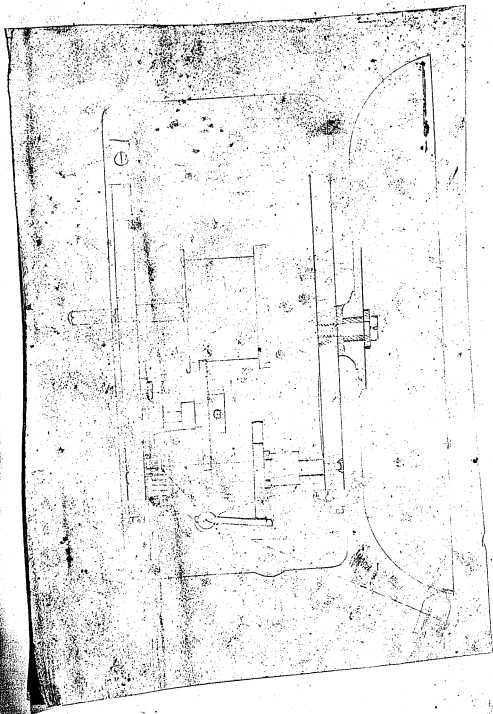
11 baires
33 baires
24 baires

43



Char Batchelor





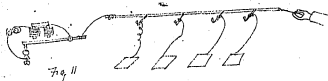


Fig. 11



Fig. 12

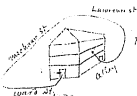


Fig. 13

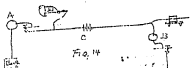


Fig. 14

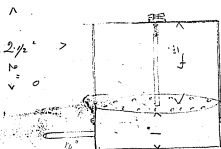


Fig. 15

①

20 Notes

This is a specimen



②

[No. 1.e. - Forwards]

THE DIRECT UNITED STATES CABLE COMPANY, LIMITED.
No. **NEW YORK, Head Office, [Always Open], 16 BROAD STREET.**

NEW YORK HEAD OFFICE,
(The public in New York is recommended to lined in Menages at this Office, whose they will be transmitted direct to their destination by independent wires.)
Always Open, 16 BROAD STREET.

FORM FOR MESSAGE, "VIA DIRECT CABLE" for Great Britain and Ireland, the Continent of Europe, Turkey, Egypt, Persia, India, Penang, Singapore, Coochin China, China, Japan, Java, Australia, New Zealand, and the East generally.

Prefix	Code	No. of Letters	No. of Words	Station	157
Route	VA	By me	Rec'd	m	181
CHARGES		By me	Counter Clerk	Special Instructions	
Amount \$	Repeating	Reply	To be paid on	Total \$	

Please to charges, A. 4. 21

Please to telegraph the following MESSAGE, "VIA DIRECT CABLE," subject to the conditions printed on the back hereof, by which I agree to abide.

Address

"Via Direct Cable"

You are requested before signing to read the Conditions on the back (in roof.)

Signature

The name of the place at which the Message originates is transmitted free of charge.

feares for the DIRECT CABLE are also received at the undenational office of the ATLANTIC & PACIFIC TELEGRAPH COMPANY.
IN OFFICE: 198 Broadway, 8 Broad St., 185 Broadway, 8 Franklin St., the St. Nicholas, Grand Central, New York and Windsor Hotel.
The Holland House, and the Produce Exchange.

TELEGRAPHY!

J. F. GILLILAND & CO.'S

Complete Telegraph Apparatus,

For Schools, Amateurs and Private Lines.

A Complete Instrument



with Battery \$3.50

THE above set represents J. F. Gilliland & Co.'s Telegraph Instrument, which is the most complete both in part and style of such that has ever been offered to the public. This instrument is substantially made, finely finished, and put up in a neat box, with battery, and is guaranteed as represented.

The receiver is made with two speeds, and has an adjustment for the lever, so that it can be worked with either a strong or weak battery, an attachment which you will not find on other cheap instruments. The Key is the same style as that used by the Western Union Company, but of a miniature size, with good platinum points which is a great deal easier to write with than the common spring lever key that is used on other cheap instruments.

Any one learning the art of Telegraphy on this instrument is capable of taking an office on any line.

The Battery furnished with this instrument is the most complete ever offered with any cheap instrument.

It is a Carbon Battery, being very powerful, and if kept open will retain its strength for four or five days without reworking.

The material used is the best that can be had. The best rolled sheet zinc, carbon and No. 1 porous cups, and for the convenience of students and those using them we have put post connections on the zinc and carbon, which facilitates the connecting of the wires, and making a better connection for the current.

In fact we have not neglected a point, or spared any pains in making this instrument what we justly claim, superior to all others.

A book of instructions will accompany each instrument which will enable anyone to send and receive a message of care, intelligible as if by magic. Also, how to run lines, set up Batteries and connect instruments, and all necessary information pertaining to Telegraphing.

THE ART OF TELEGRAPHING.

YOUNG MEN AND YOUNG LADIES:

Your attention is directed to this fascinating study, not only as a means of enjoying your leisure hours, but as an instructor. It cultivates the mind, teaching all those who practice it to read, write and spell correctly, and is considered by experts and those acquainted with the art, to be the best teacher in these branches that can be had.

Business men, men of leisure, and in fact everybody should give their attention to this beautiful study, for the time will soon come when everyone must be able to Telegraph, in order to be eligible to any important, lucrative and confidential position in mercantile life.



The above cut represents a party of ladies and childrens reading and receiving messages from their friends, and business men with their companions in different parts of the city or country with the electric current in a moratorium, learning at the same time a business which will bring them a good livelihood, and is considered by all to be the grandest of studies and indispensable to business.

SEND YOUR ORDERS TO:

J. F. GILLILAND & CO.

Manufacturers and Dealers in Telegraph Machinery and Supplies.

21 W. Cor. FIFTH and Elm Sts., CINCINNATI, OHIO.

Consent sent to any part of the country
C. O. D. or delivery of price.

(continued from previous page)

(continued from previous page)

3C

1 half higher

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5C

1 half higher

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Edison

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same

16C: resembling longer tube cross of frog -

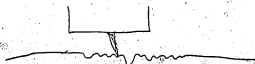
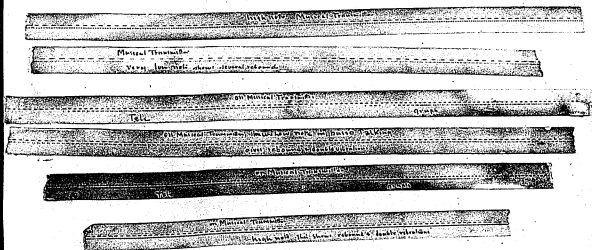
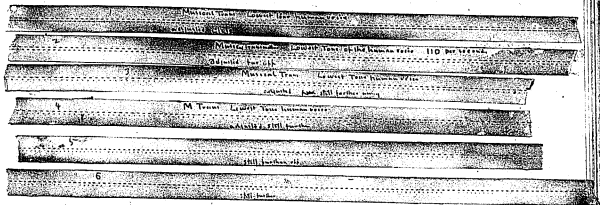
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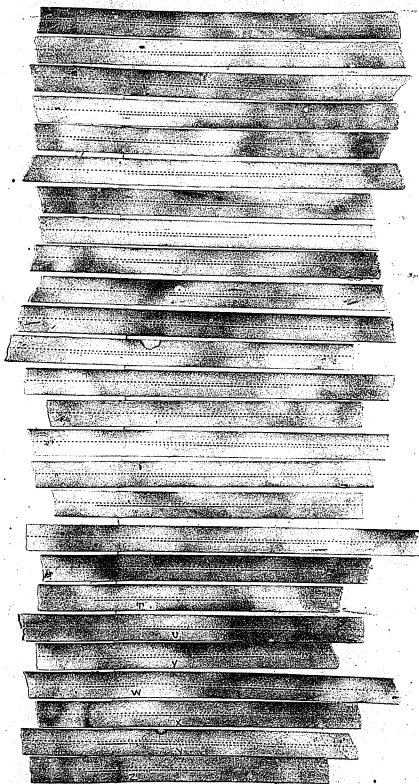
Physical characteristics of the instrument

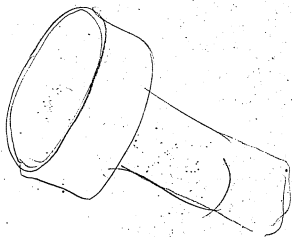
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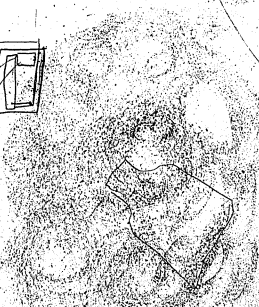


+





Postcard



CONVICTS IN GEORGIA.
Col. John T. Brown, keeper of the Penitentiary of Georgia, has supplied the Atlanta Herald with the following information: The whole number of convicts in the Georgia Penitentiary is 1,200. Of these, 1,000 are in the State Prison, and 200 are in the County Jail. The State Prison is divided into four divisions, each of which is further divided into four sections. The divisions are: 1. The Division of the State Prison, 2. The Division of the County Jail, 3. The Division of the State Prison, and 4. The Division of the County Jail. The sections are: 1. The Section of the State Prison, 2. The Section of the County Jail, 3. The Section of the State Prison, and 4. The Section of the County Jail. The State Prison is divided into four divisions, each of which is further divided into four sections. The divisions are: 1. The Division of the State Prison, 2. The Division of the County Jail, 3. The Division of the State Prison, and 4. The Division of the County Jail. The sections are: 1. The Section of the State Prison, 2. The Section of the County Jail, 3. The Section of the State Prison, and 4. The Section of the County Jail.

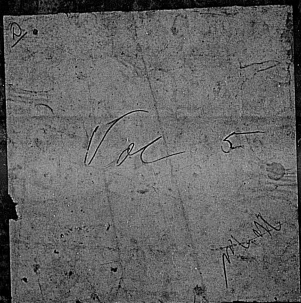
Engine Room Tel.
Flying Machine
~~W. H. D.~~ Dynamometer
Wire Annular
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Photograph.

[ITEM FOUND IN BOOK]

Laboratory Notebook, Cat. 30,095

This notebook contains only a few dated entries, covering the period March 1874-January 1875. Most of the entries are by Charles Batchelor and are primarily calculations and drawings of component parts of instruments relating to the domestic, automatic, and printing telegraph systems. In the middle of the volume are blue stains, apparently made by the disks used in Edison's recording telegraphs. A list of six names and addresses can be found near the end of the volume. The cover is labeled "Vol. 5." The book contains approximately 200 unnumbered pages. Many leaves have been torn out.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 18:1



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Parts wanted for copying End

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50	second wheel shaft	Mon	
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50	100 = wheel		
50	60 =		
50	escape wheels		
50	palets		
60	jam nuts	Mon	
140	girders		
50	paper drums		
50	feed rollers		
60	strippers		
60	clicks		
60	— springs —	60	
50	double taper pins		
50	paper feed holders		
50	long shoulder screws for paper feed	Mon	
50	short = =	Mon	
50	feed levers		
120	frames		
480	8/32 screw	Mon	
120	45 " = =	Mon	

Switch

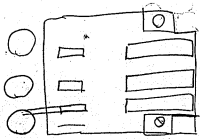
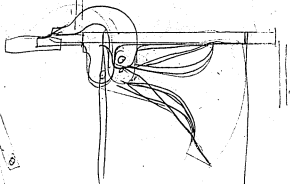
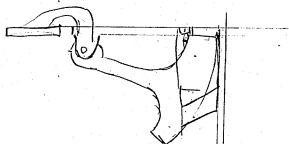
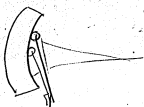
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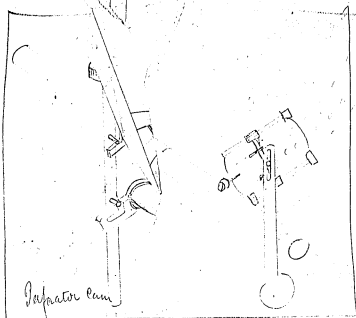
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Rubber bands 30 w 30 f

Binding posts 120 w



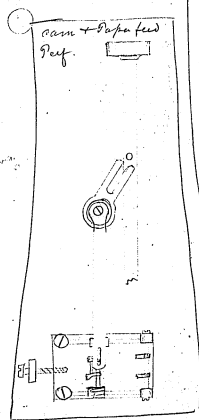




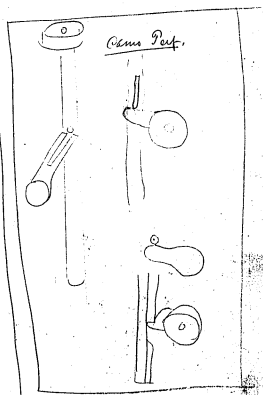
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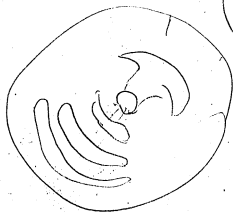
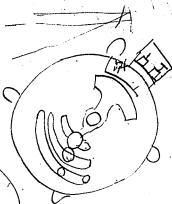
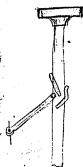
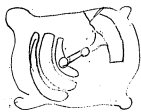
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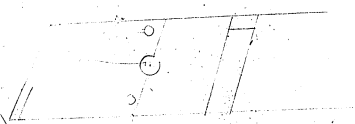
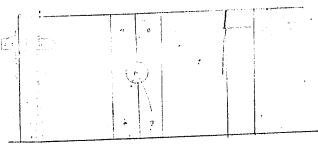
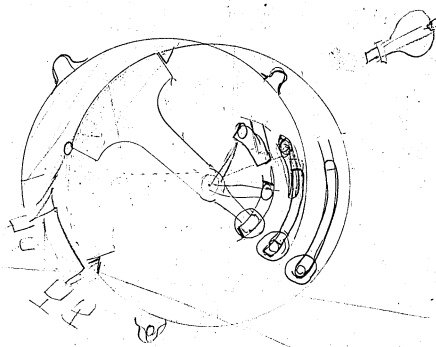


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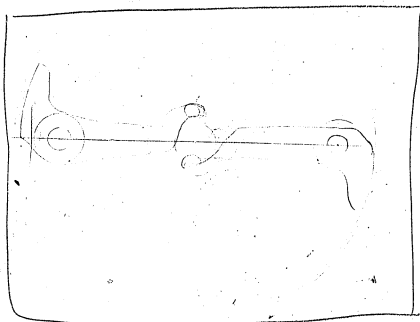
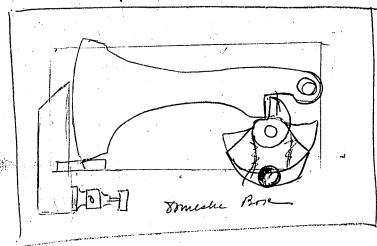


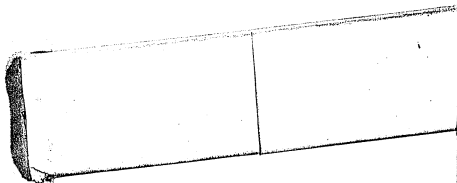
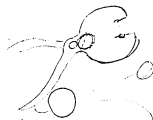
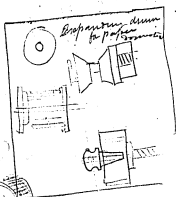
Cam Perf.





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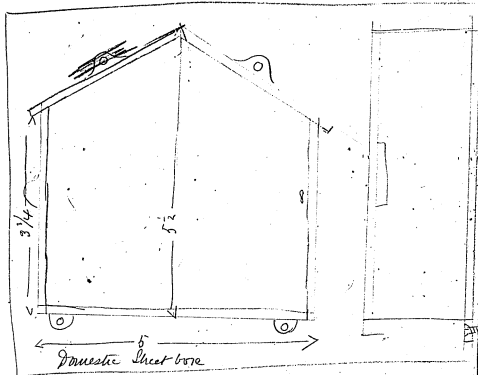
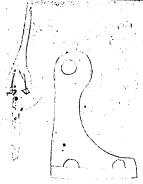




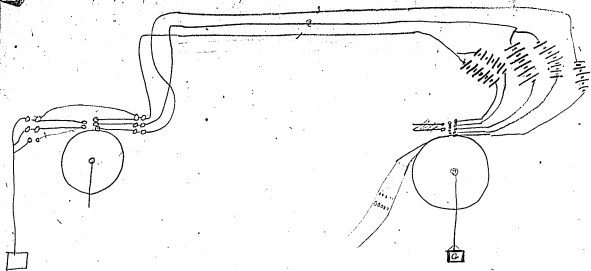
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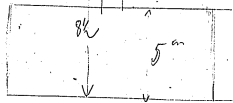
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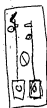


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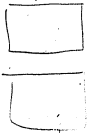
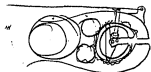
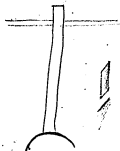
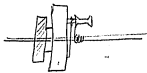
6472

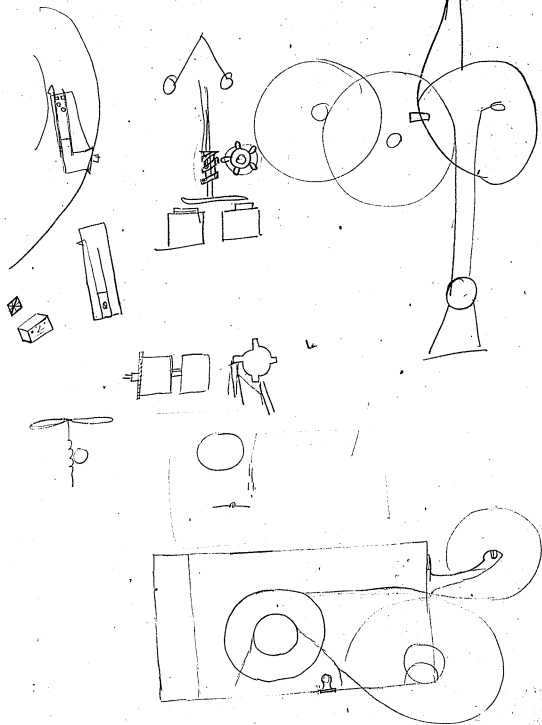


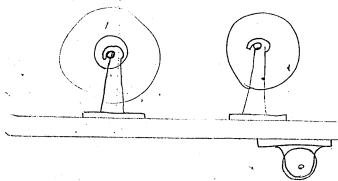
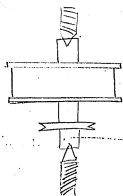
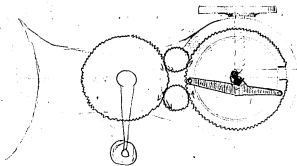


338 Schell

2





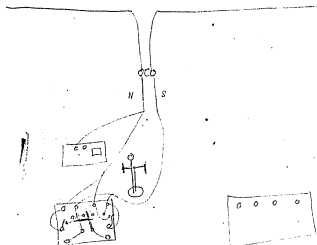
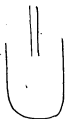


1 = 200 mm
2 = 50 ~
11.10.73

1 = 200
200
11/6 0 0 0
546

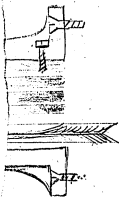
Spencer, and others

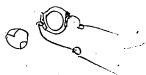
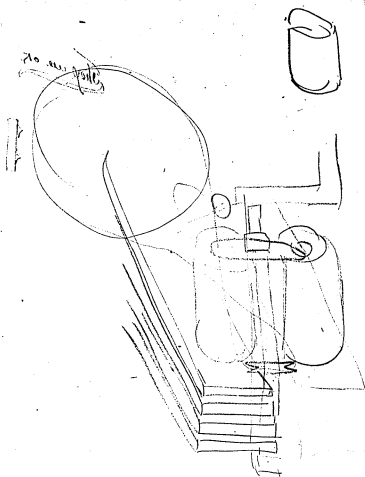
They are OK

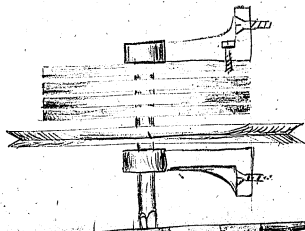


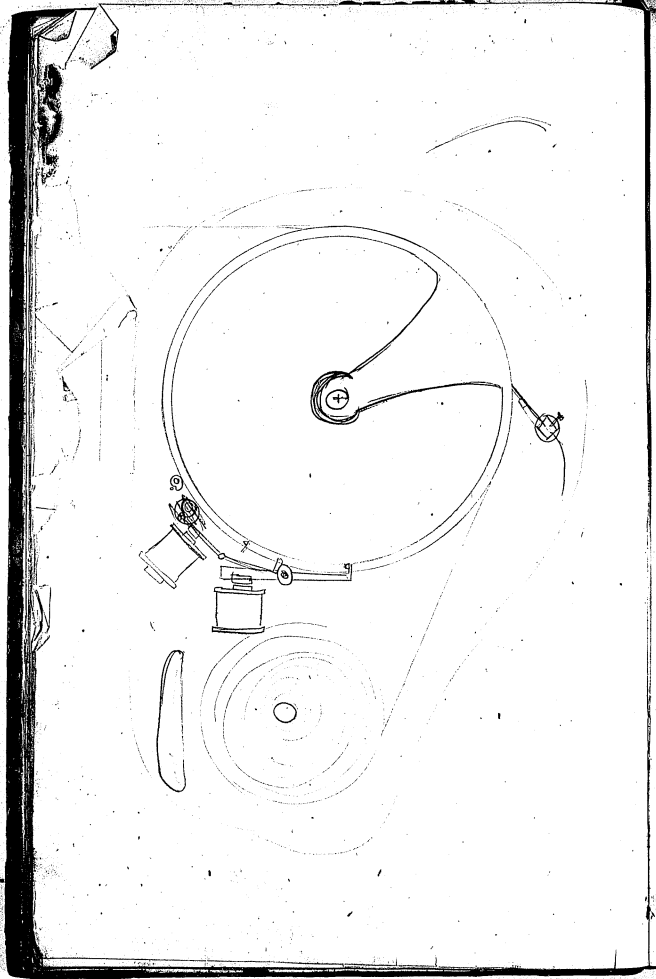
11/11/11

11/11/11









24611

6)14

$$\begin{array}{r} 24611 \\ -12305 \\ \hline 12306 \\ -12305 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1232 \\ -1231 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 0214 \\ -0213 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 0214 \\ -0213 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 24611 \\ -12305 \\ \hline 12306 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 24611 \\ -12305 \\ \hline 12306 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 24611 \\ -12305 \\ \hline 12306 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

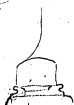
$$\begin{array}{r} 1235 \\ -1234 \\ \hline 1 \end{array}$$

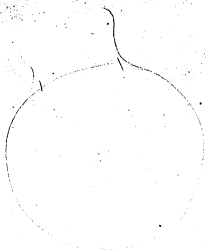
Handwritten calculations for the first three problems:

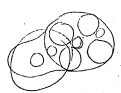
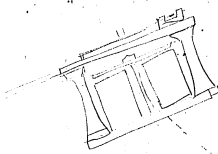
Problem 1: $25 \times 15 = 375$

Problem 2: $22 \times 41 = 902$

Problem 3: $18 \times 14 = 252$

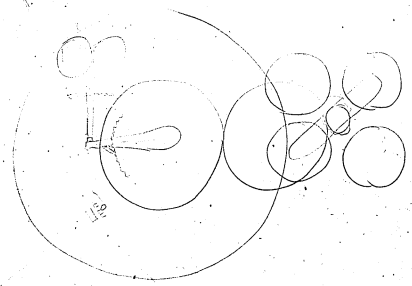


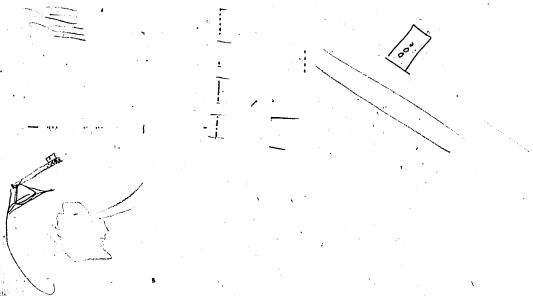
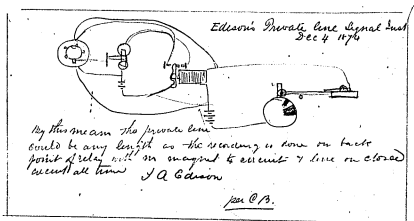


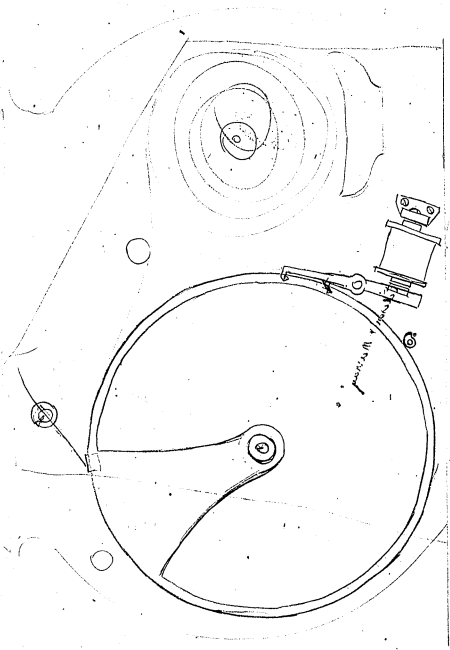


18
12
3
30

360

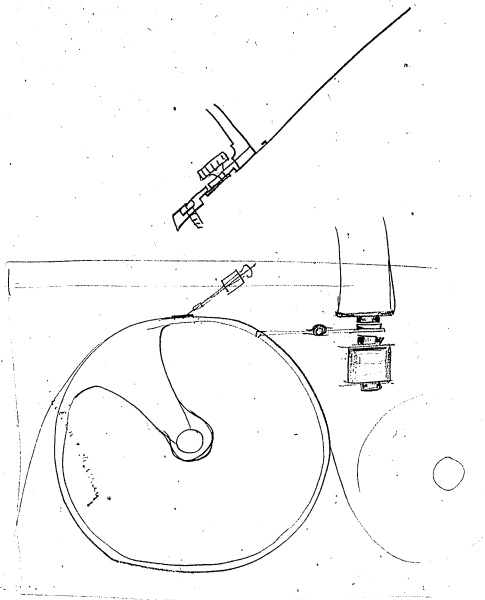


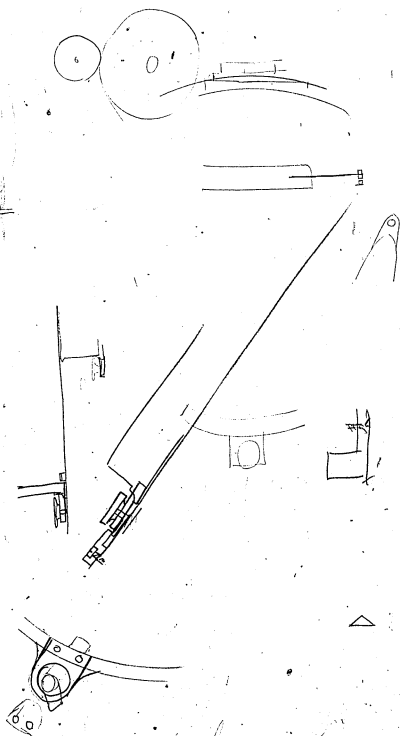




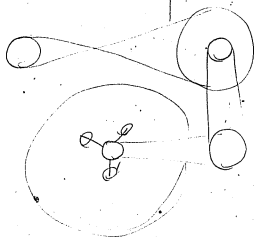
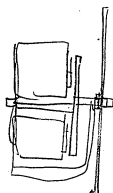
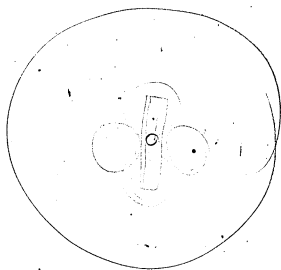
2

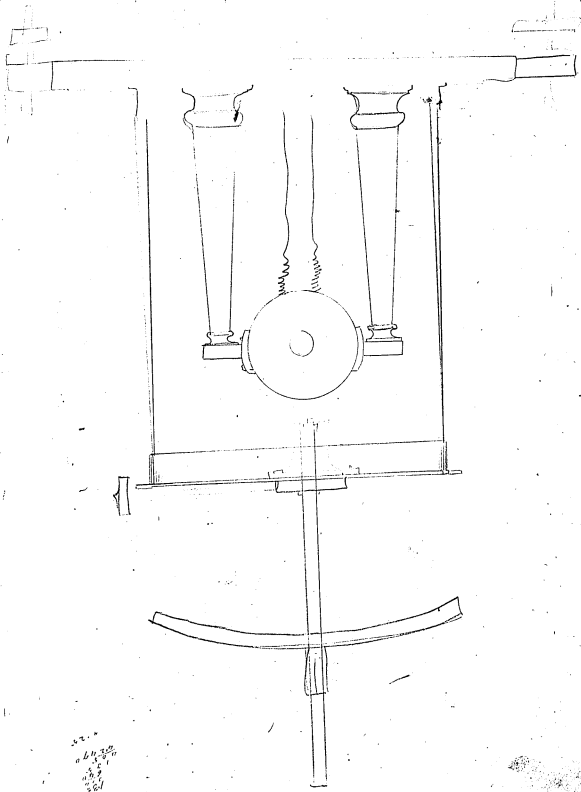
20





New Separator





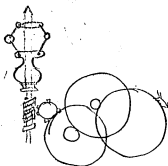
42.
a 64 700
1 50
1 50
1 50
360

$$\frac{184}{62}$$

$$7 \frac{2}{11}$$

$$60 - 20 = 200$$

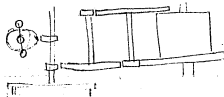
$$3 = 1$$



$$mch$$

$$67 = 20 \text{ m. r. d.}$$

$$70 = 48 \text{ m. r. d.}$$



$$mch$$

$$20 \text{ m. r. d.}$$

$$48 \text{ m. r. d.}$$

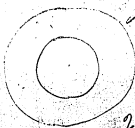
$$\frac{250}{354}$$

$$\frac{1000}{1500}$$

$$\frac{2500}{1500}$$

$$\frac{1000}{1500}$$

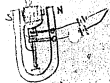
$$15 \cdot 4 \cdot 1500$$



$$400$$

$$2 = 1 \text{ m. r. d.}$$

$$2 \frac{1}{2}$$

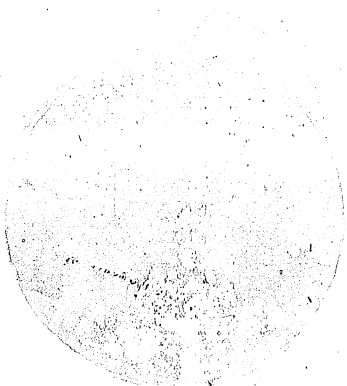
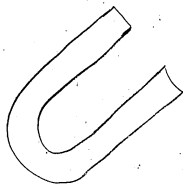


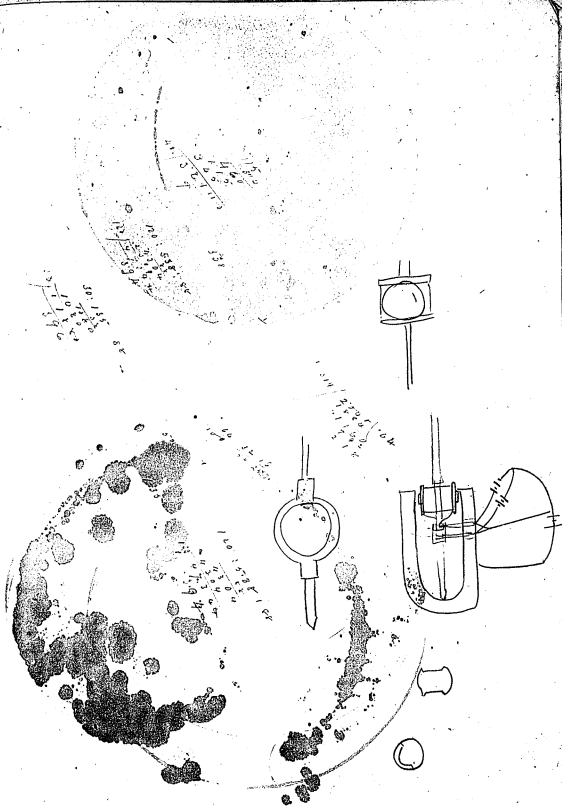
$$1200$$

$$1200$$



Handwritten numbers and symbols in the top right corner, possibly a ledger or index.





60 inches = 20 words rev. Perf drum 2 1/2 mil
270 inch = 70 words rev.

42 inches = 1 word of Perf.
3 inches = 1 word of Rev.

400 words per minute 2 1/2 drum Perf: 7 inch per revolution 4 1/2 per word.
= 260 revolutions

400 words per minute at 260 rev, 3 1/2 per word per = 1.47 diam of drum

1 year. 1 turn per minute	160 inch 09 pitch	diam	4.59	4.67
2 year. 16 " "	150 " 09 pitch	"	4.30	4.38
3 " 240 " "				
4 " "				



Black Powder drum
Hawmull

7/240
4

2.25
3.15
9.00
2.25
6.75
7.46.50

150
1850

400
4
1600
200
1800
260

400
1200

4.62
27.720
9.24
12.01.20

7.45%

73/6616 14.4000 4.58
125664
183360
157080
202800

31.2 150
1.370 4.3
1.56
2.40
9.62

4.38
4.38
180
100
12.10

260/1200 4.62
1340
160
1.60
400

3.14/4.62 1.47
3.14
1.480
1250
2240

160
1280
160

3.14/4.62

240
7420

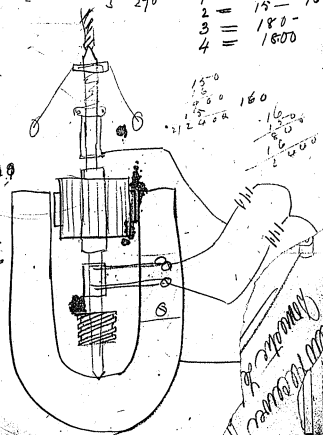
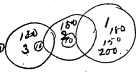
240
1500

314.6 135000 4.30
125664
183360
62832
305280
282744
23.536

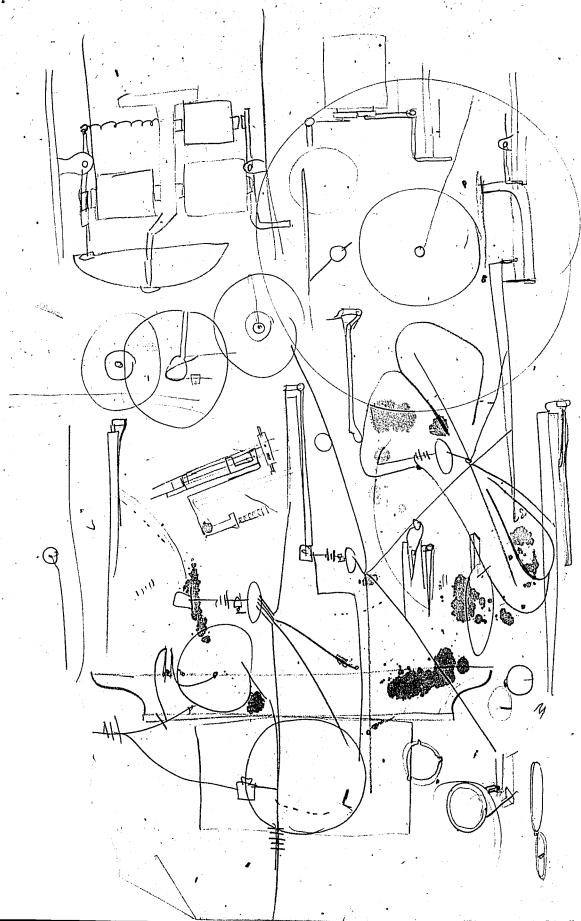
150
1500
1800

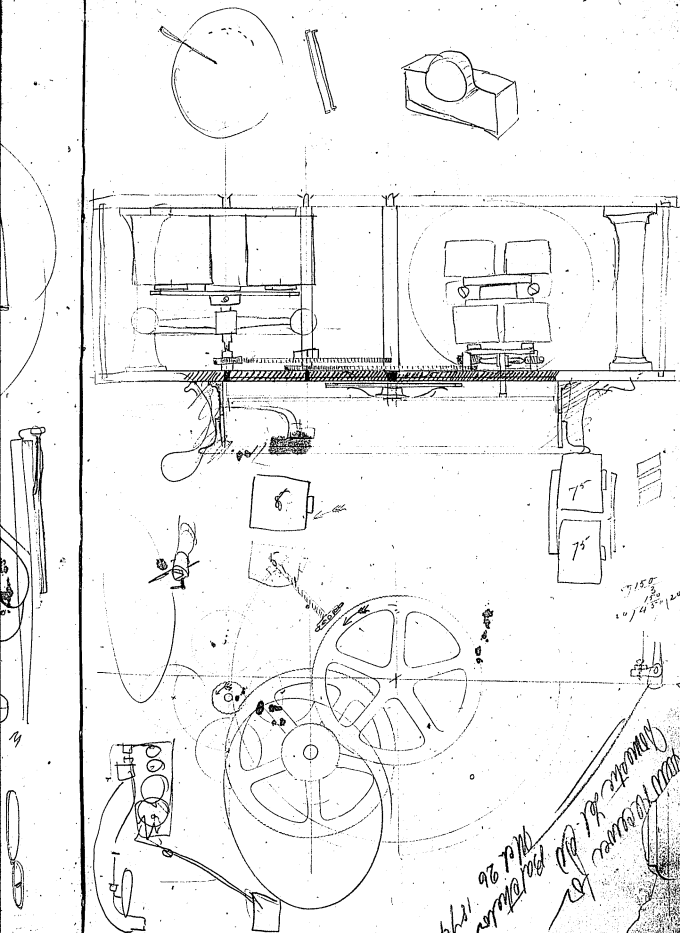
1- 18
2- 270

1 = 15-16
2 = 180-
4 = 1800

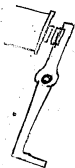
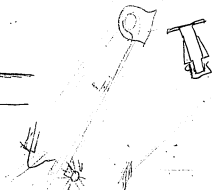


Handwritten note: "Handwritten note" (illegible)

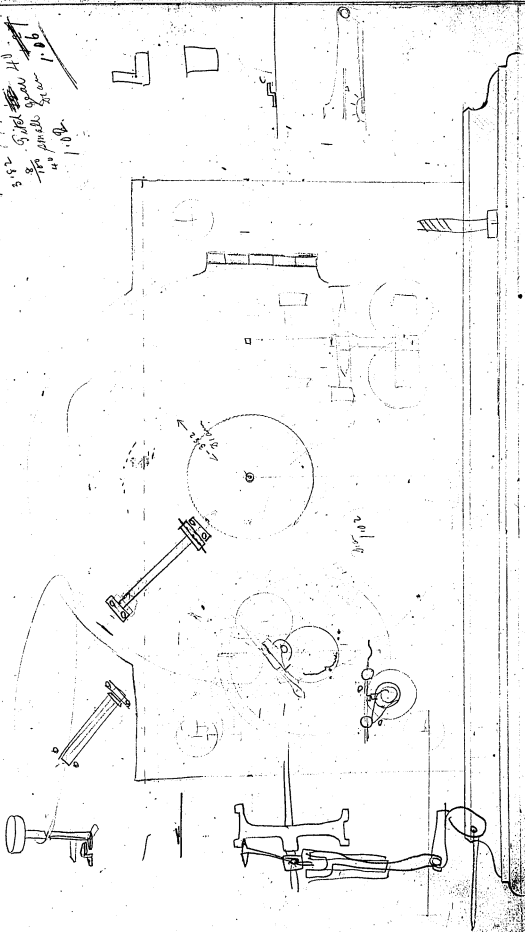


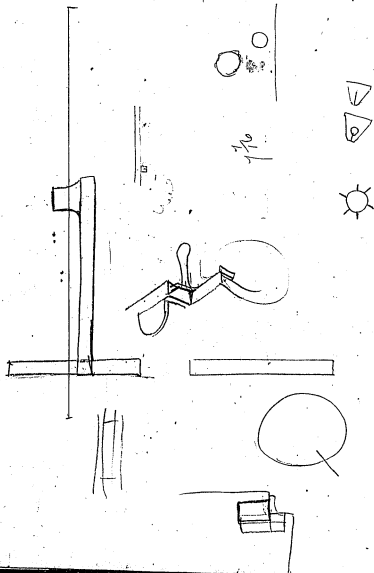
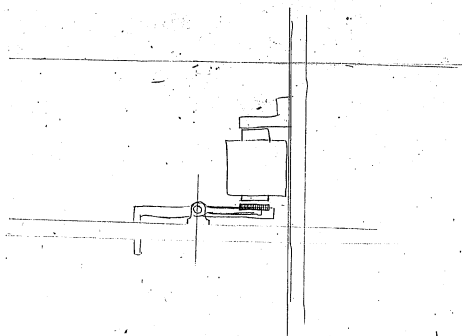


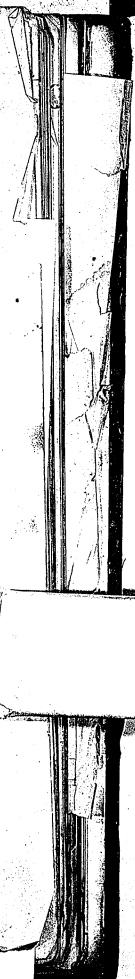
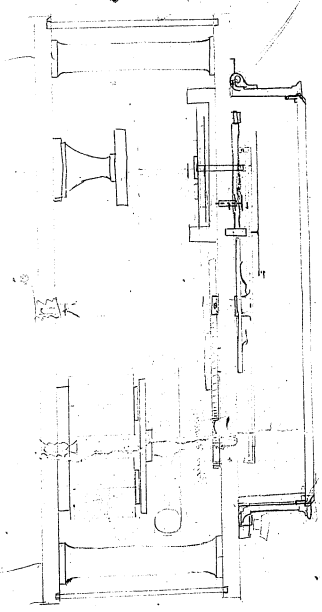
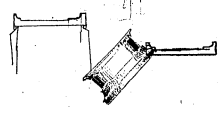
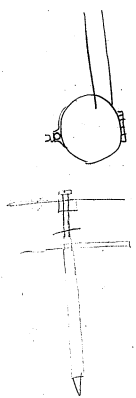
Charles Botscher
 Electrician Boston

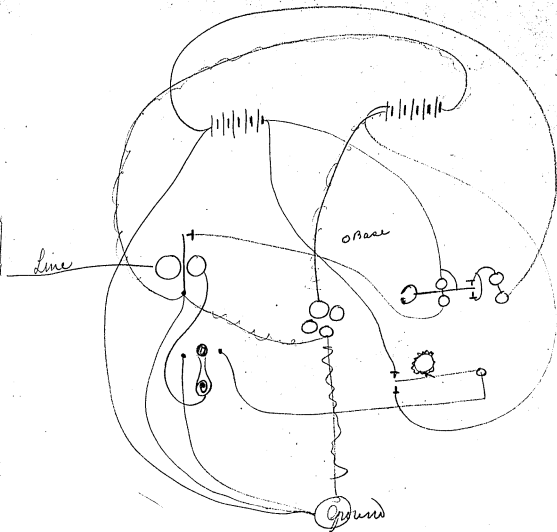


~~150~~ 150 karp gran 4.50
 3.52 5.00 ~~4.00~~ 4.00
 8.00 10.00 gran 1.00
 4.00 1.00



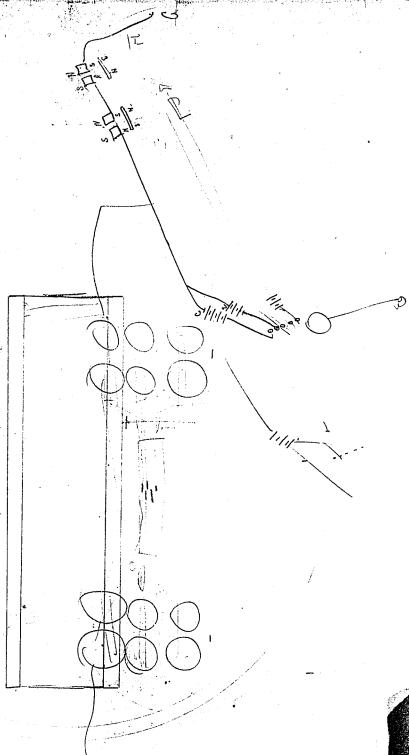






11

11



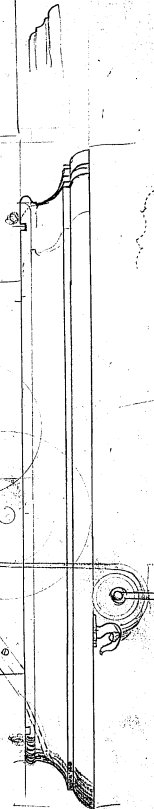
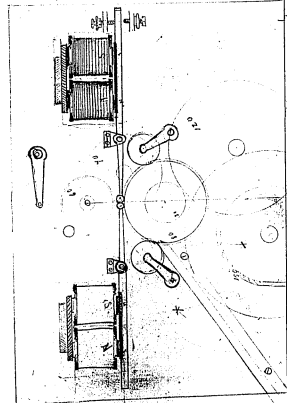
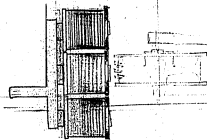
③

11

1-10
2-80

1-10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

10-2

[illegible]

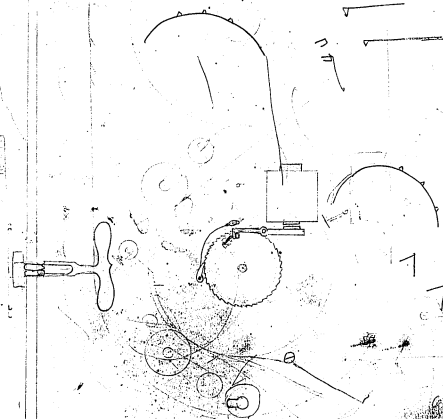
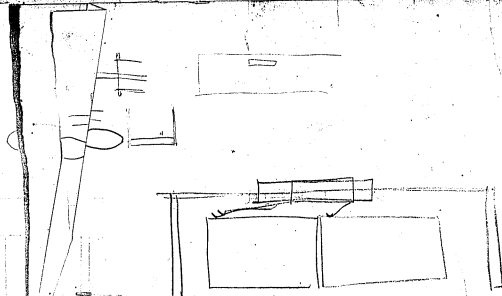


[ITEM FOUND IN BOOK]

19 Ad. thrust 2000-
80 Papa gilda screw.
22 Birdnest.
14 shell parts
New post. 33
140 Nests & eggs
300 64 Hurtle.

2 2 2 2 2
2 2 2 2 2
2 2 2 2 2
2 2 2 2 2



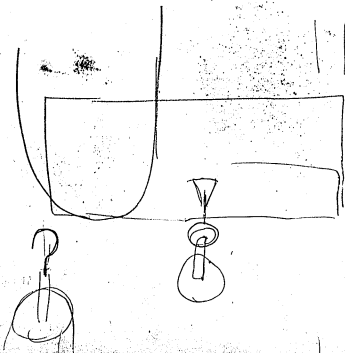
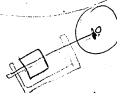


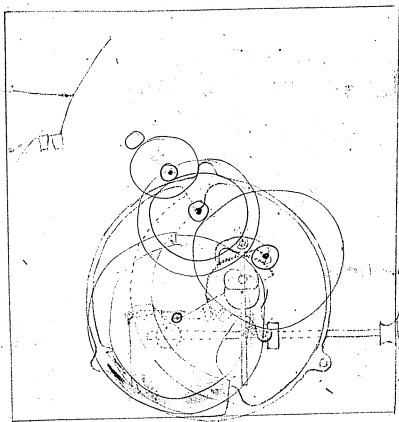
*Experiments in
Gears*

34
16
50
25
25

100
750

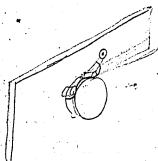
2 1/2
11 1/2



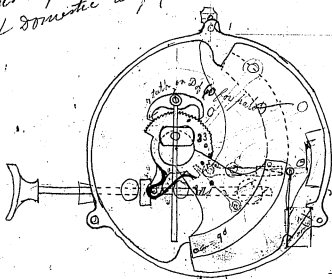


100 mm

Num 2^e de
1^{er} et de 4^{me}

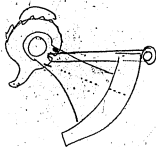


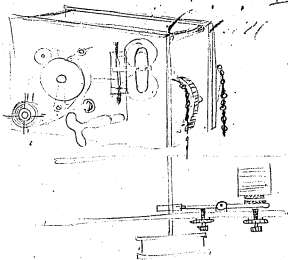
Edison's Signal Inc for
 Frie & Domestic Telegraphing



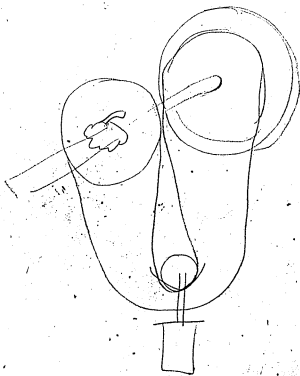
Designed Nov 22nd 1874

Chas. Batchelor

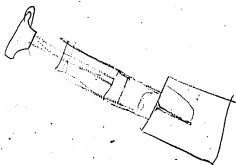
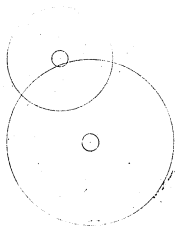




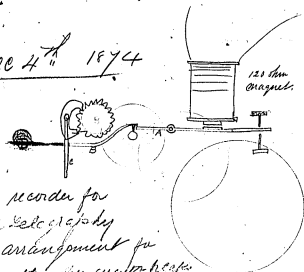
7/6 3/8



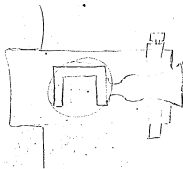
17



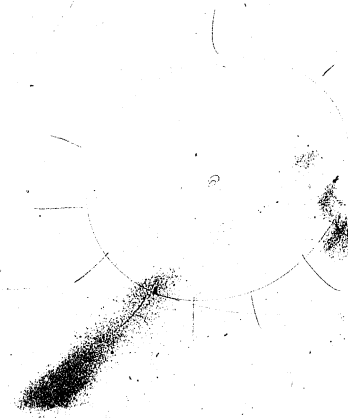
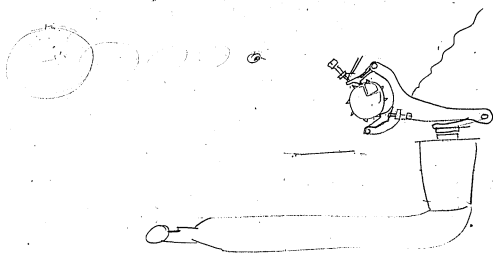
Dec 4th 1874



Edison's recorder for
Domestic telegraph by
release arrangement for
closed circuit when current breaks.
The cover strips of arm B & release
C



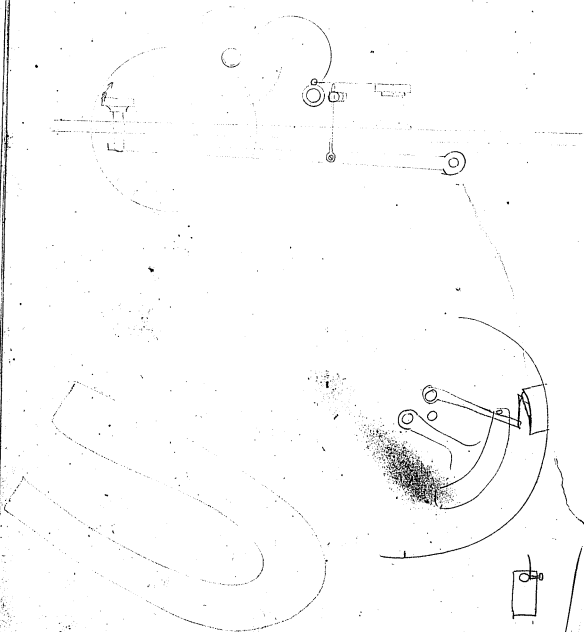
54
22
32
86



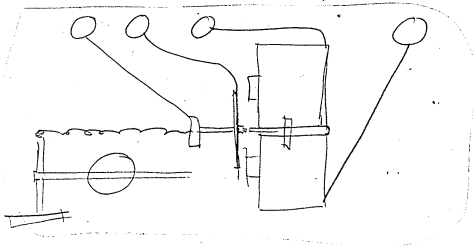
1150 - 160
 1100 - 3

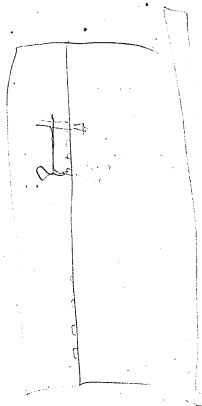
40

0 9 3
 1 6 4
 3 7 5
 3 0 6



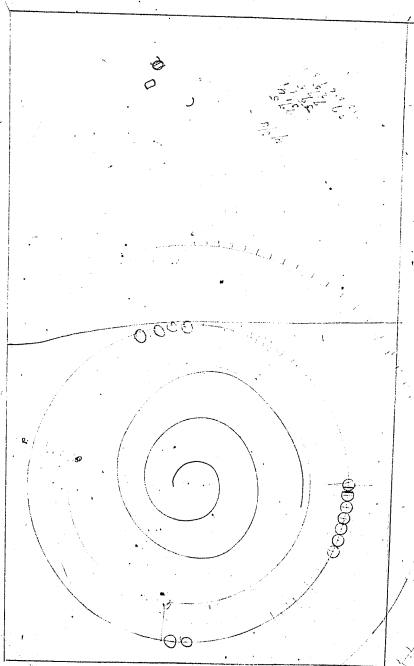
Dec 18. 1874
Connections for Short core Quadriples
Relay





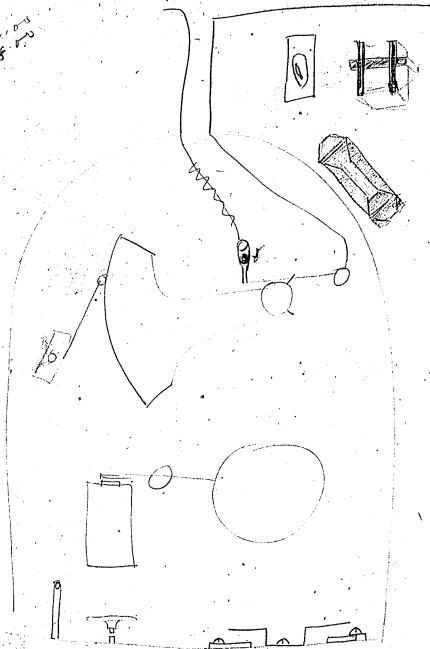
2/10/10

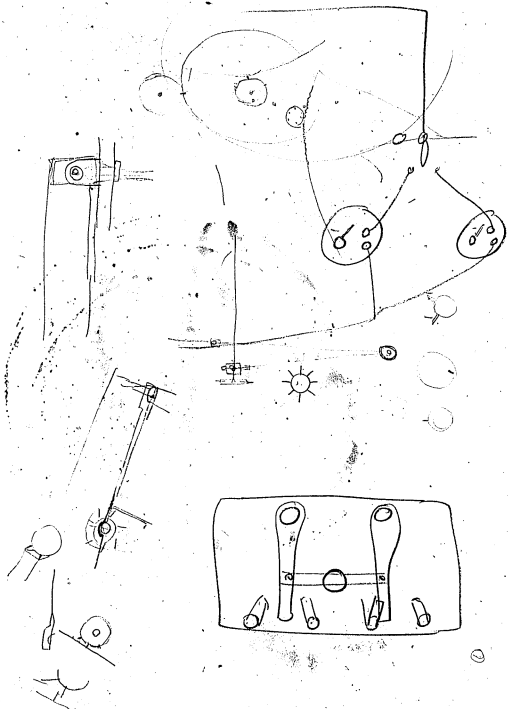
1100
1000
1000



1100
1000
1000

30 4 18 4 18





80941/6

15
3 60
1 66
1 66

found 18" Dia

2160" h. m. i.

100

2160" h. m. i.



12 9 6 1
1 1 1 1
90

9 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

7-1

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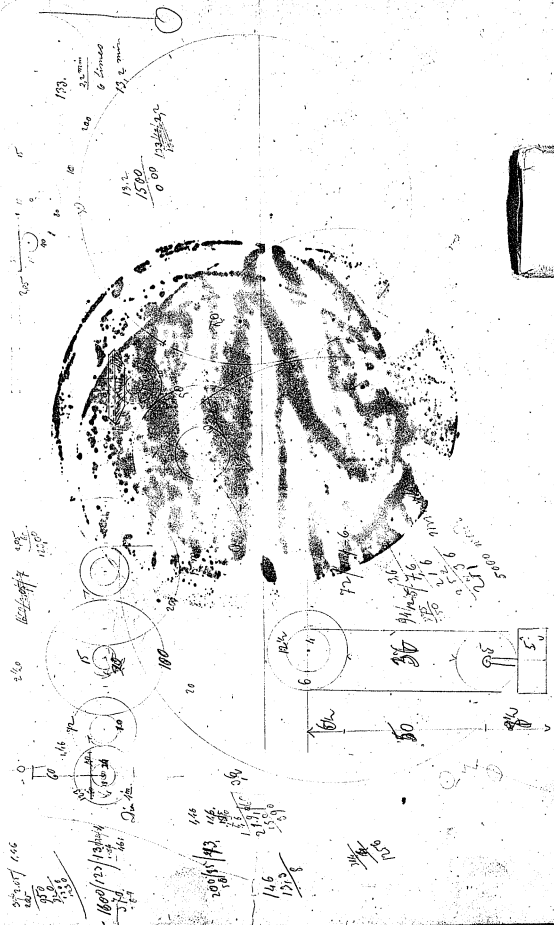
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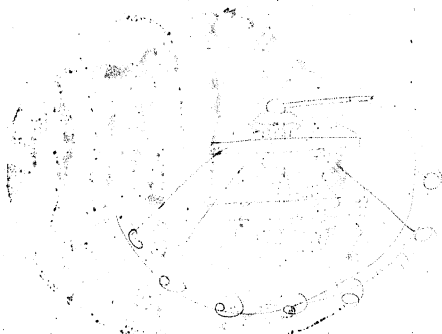
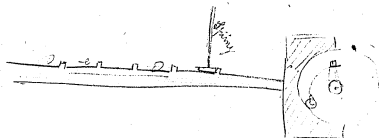
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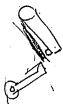
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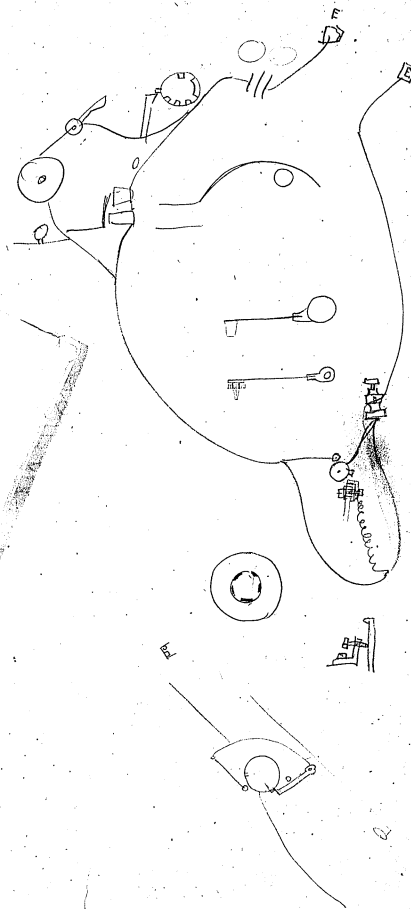
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50 750









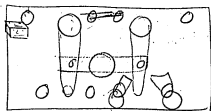
4 plates of each metal 4" long + 1" wide
will bind fast on



Iron
Brass
Copper
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Platina
Nickel
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German silver
Lead
Gold
Magnesium

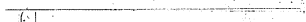
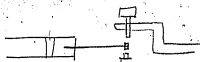
8 Keys or bases weighted
4 Keys or bases weighted, backpoints, -

1 Double Switch for Domestic



\$2.00

1 Paper Water to take 1" $\frac{1}{4}$ or $\frac{1}{2}$ " paper



200



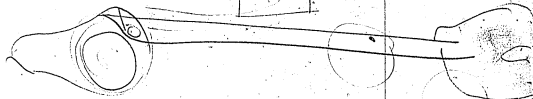
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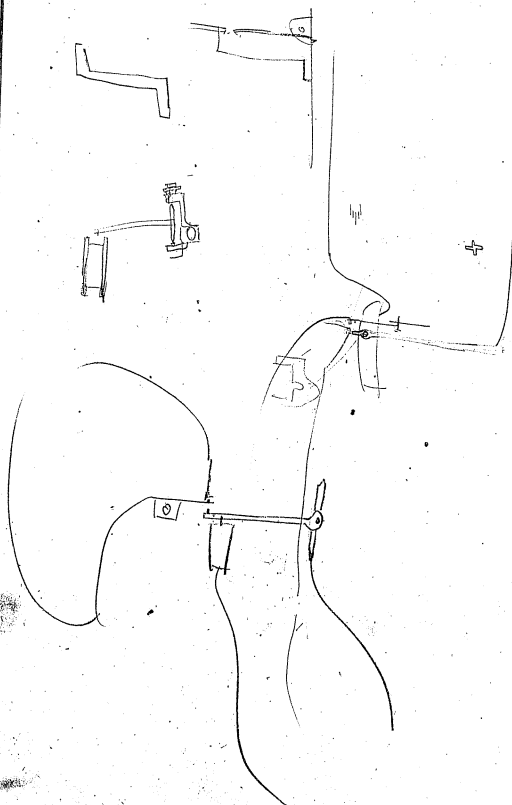
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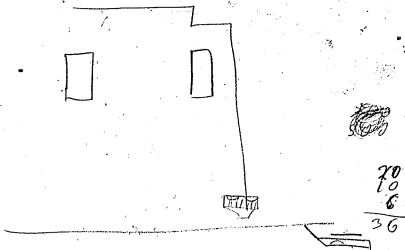


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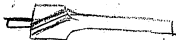


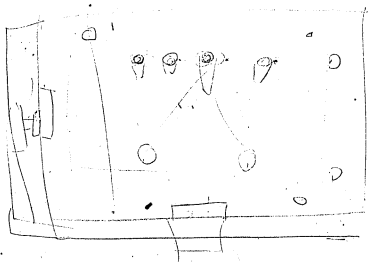
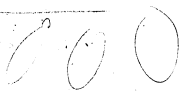
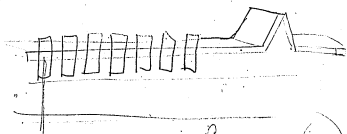
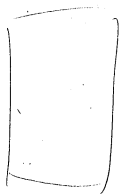


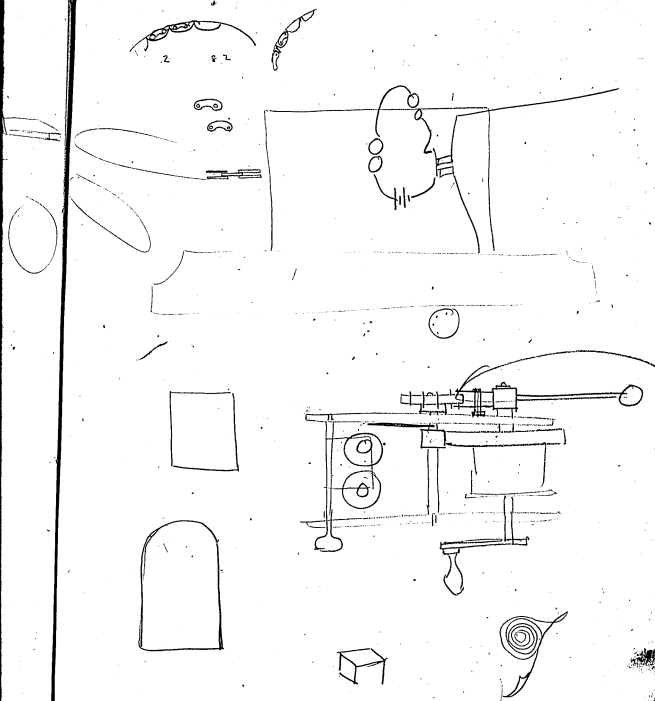


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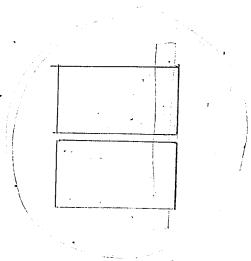
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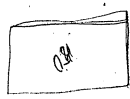
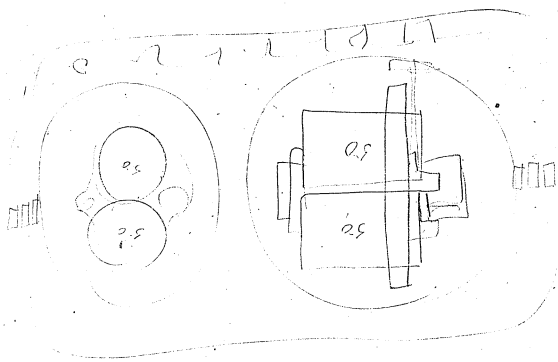


La Machine à vapeur de la machine à vapeur

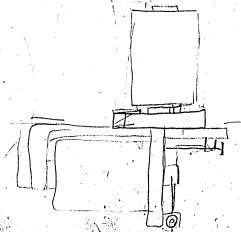
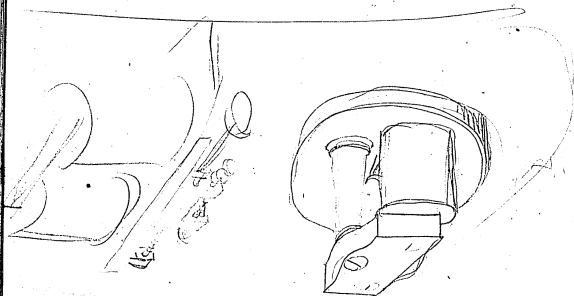


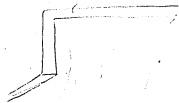
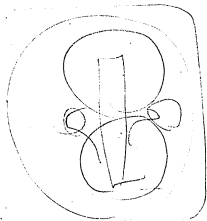
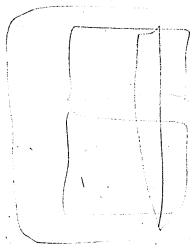
Box 2 1/2

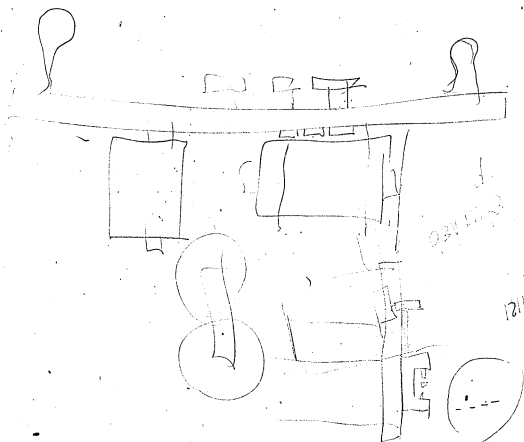
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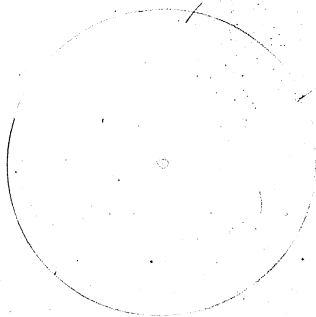


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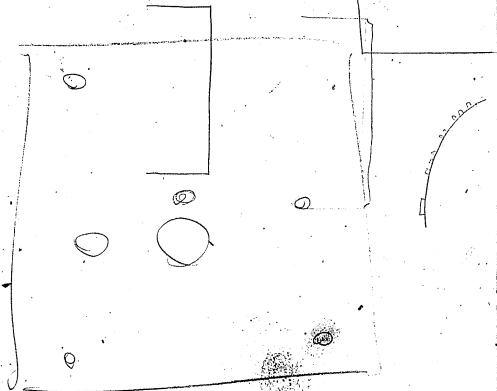
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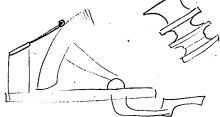
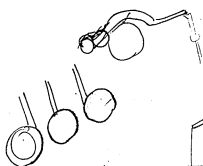
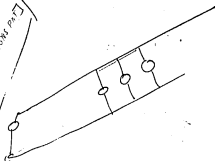
Change the lugs



THE DOMESTIC TELEGRAPH CO.
PUSH IN & LET GO

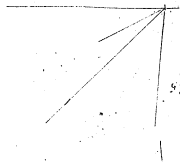
ONCE FOR MESSENGER
TWICE FOR POLICEMAN
THREE TIMES FOR FIRE





$$\begin{array}{r} 12 \\ 258 \\ 208 \\ \hline 410 \end{array}$$

h61



$$\begin{array}{r} 1.5 \\ 1.2 \\ \hline 2.7 \end{array}$$

$$\begin{array}{r} 2.5 \\ 2.5 \\ \hline 5.0 \end{array}$$

$$\begin{array}{r} 4.5 \\ 2.5 \\ \hline 7.0 \end{array}$$

$$\begin{array}{r} 1.5 \\ 1.5 \\ \hline 3.0 \end{array}$$

$$\begin{array}{r} 0.5 \\ 0.5 \\ \hline 1.0 \end{array}$$

$$\begin{array}{r} 1.5 \\ 1.5 \\ \hline 3.0 \end{array}$$

$$\begin{array}{r} 0.5 \\ 0.5 \\ \hline 1.0 \end{array}$$

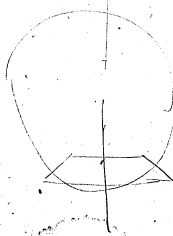
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$$\begin{array}{r} 5.5 \\ 2.5 \\ \hline 8.0 \end{array}$$

$$\begin{array}{r} 0.5 \\ 0.5 \\ \hline 1.0 \end{array}$$

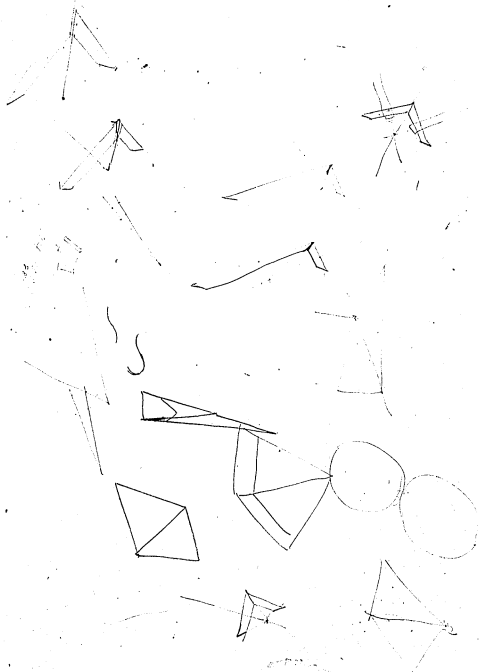
$$\begin{array}{r} 1.5 \\ 1.5 \\ \hline 3.0 \end{array}$$

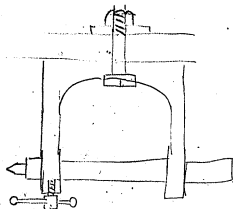
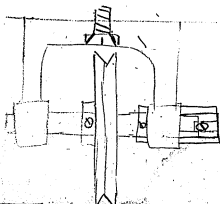
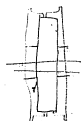
$$\begin{array}{r} 1.5 \\ 1.5 \\ \hline 3.0 \end{array}$$



42.1
40.0
2.1
44.1
42.5
1.6

42.1
40.0
2.1
44.1
42.5
1.6





Roman perforator

1. line 1.

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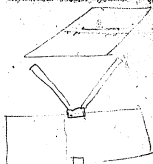
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- S 2-8-9-7-9-11-12-17-18-20-21-22-23-24-25
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- U 1-7-8-9-10-11-12-13-14-20-21-22-23-24-25
- V 1-2-3-4-6-7-9-10-11-12-13-14-16-17-19-20-22-23-24-25
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- X 2-3-4-6-8-10-11-12-13-15-16-18-20-22-23-24
- Y 1-2-3-4-6-7-8-10-12-13-16-15-19-20-22-23-24-25
- Z 2-3-4-6-8-9-11-12-18-19-22-23-24
- Q 12-4-5-6-7-9-10-11-12-13-15-16-17-19-20-21-22-24-25

Handwritten signature or scribble.

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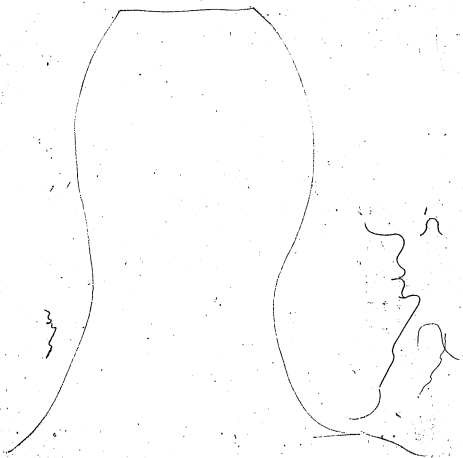
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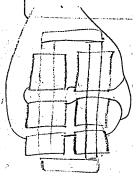
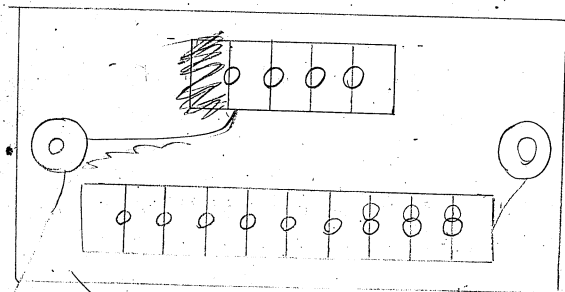
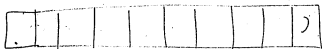
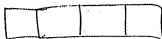
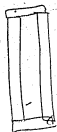
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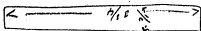
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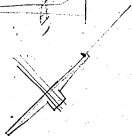
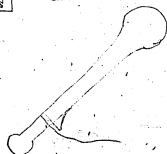
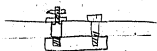
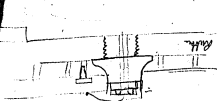
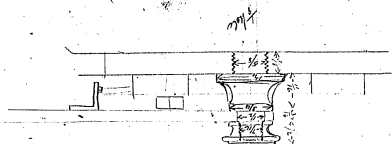


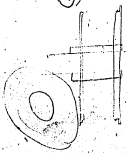
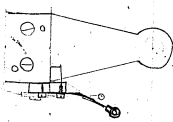
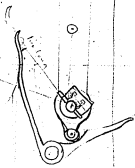
210 pins



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6 drawing sheet





have down 1/2
have down 2

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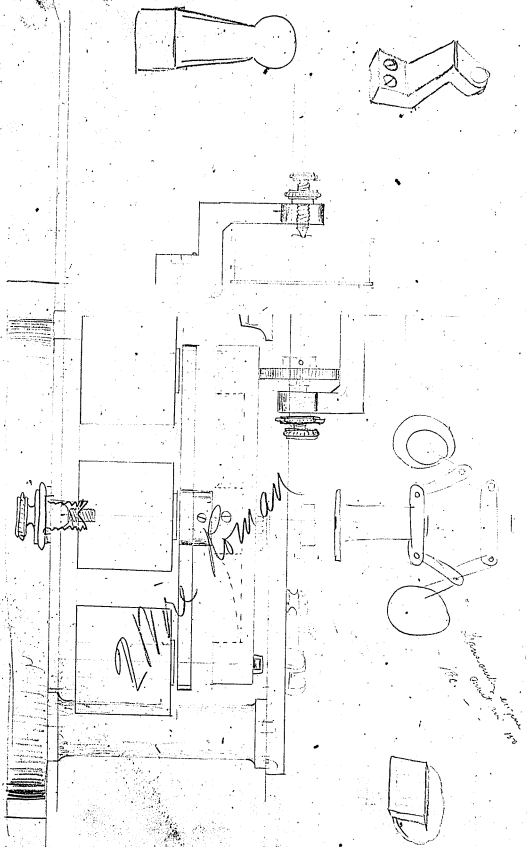
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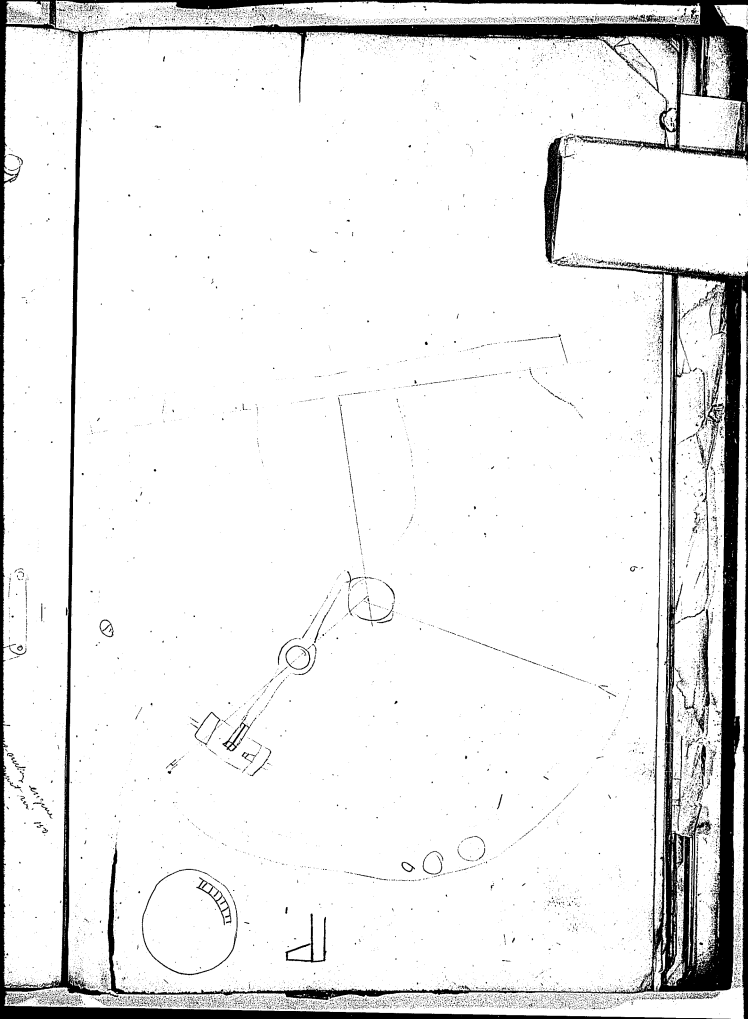


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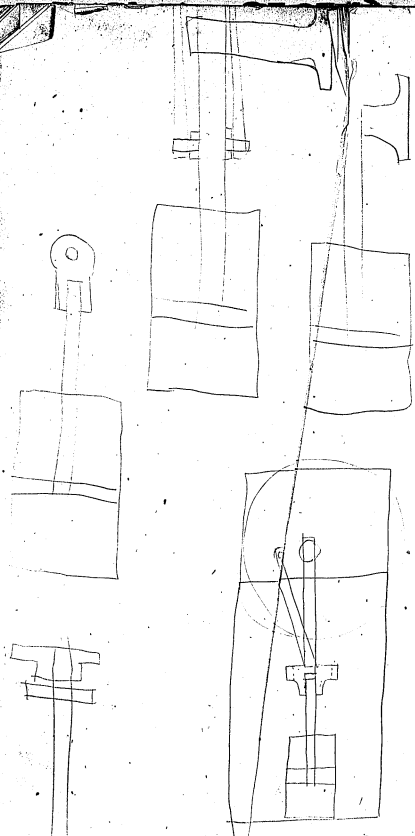
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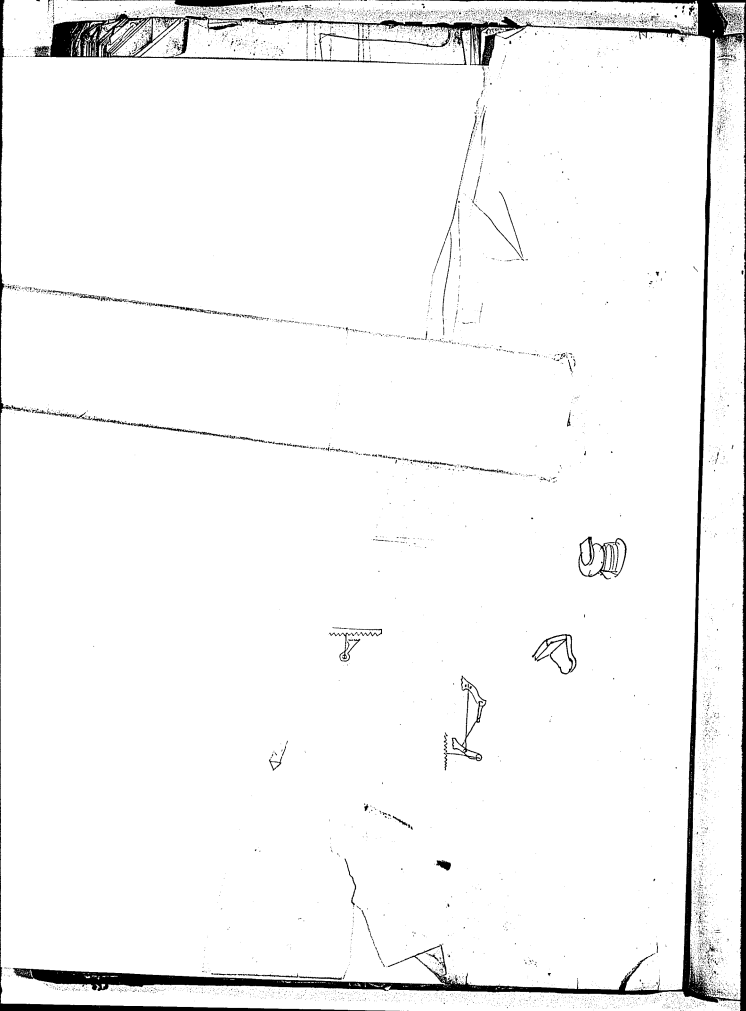
$$\begin{array}{r} 1000 \\ 1000 \\ \hline 2000 \\ 1000 \\ \hline 3000 \\ 1000 \\ \hline 4000 \\ 1000 \\ \hline 5000 \end{array}$$

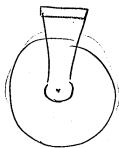
$$\begin{array}{r} 1000 \\ 1000 \\ \hline 2000 \\ 1000 \\ \hline 3000 \\ 1000 \\ \hline 4000 \\ 1000 \\ \hline 5000 \end{array}$$



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11/2

$\frac{7}{2} \times 2 = 7$

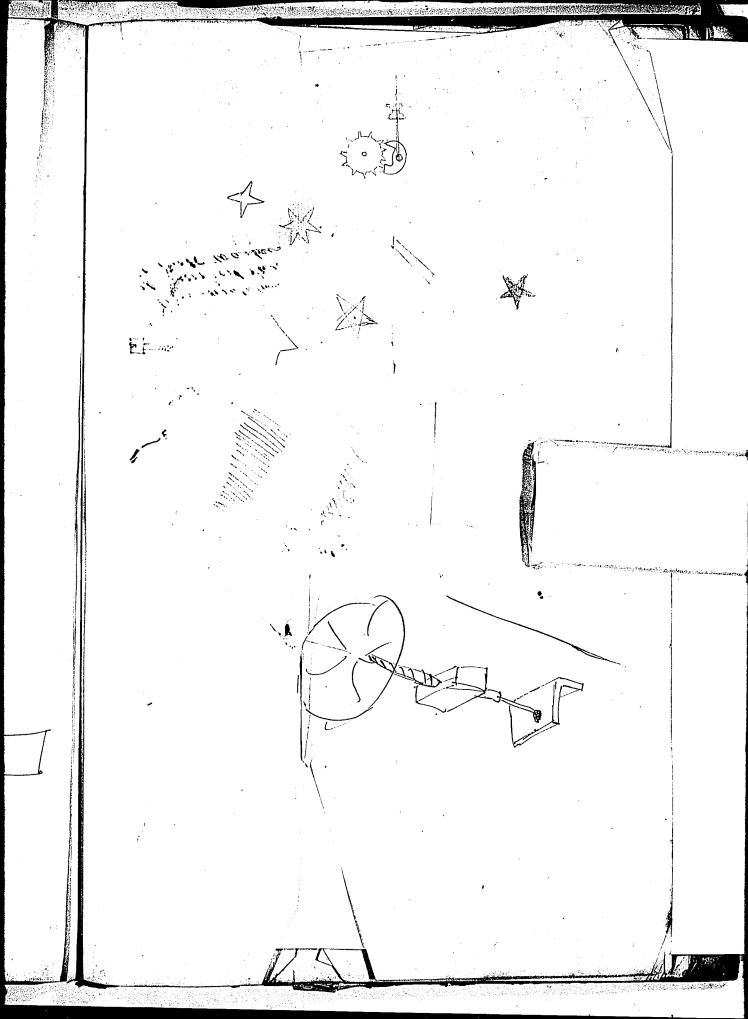


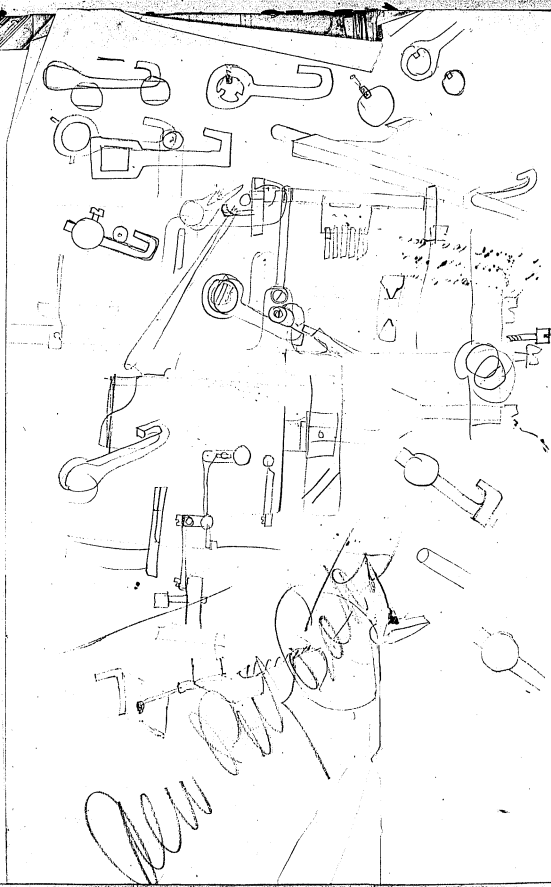


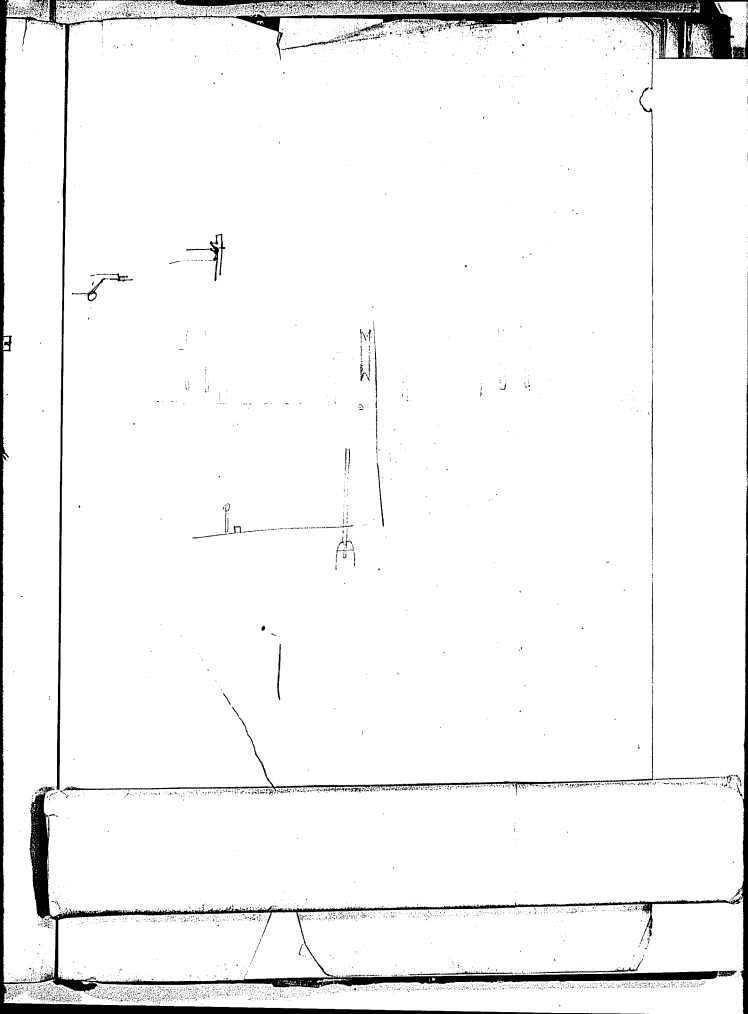
1. 100% 100% 100%
2. 100% 100% 100%
3. 100% 100% 100%

EE









Order - John Ott

Jan - 19 - 1895

7 Sounders

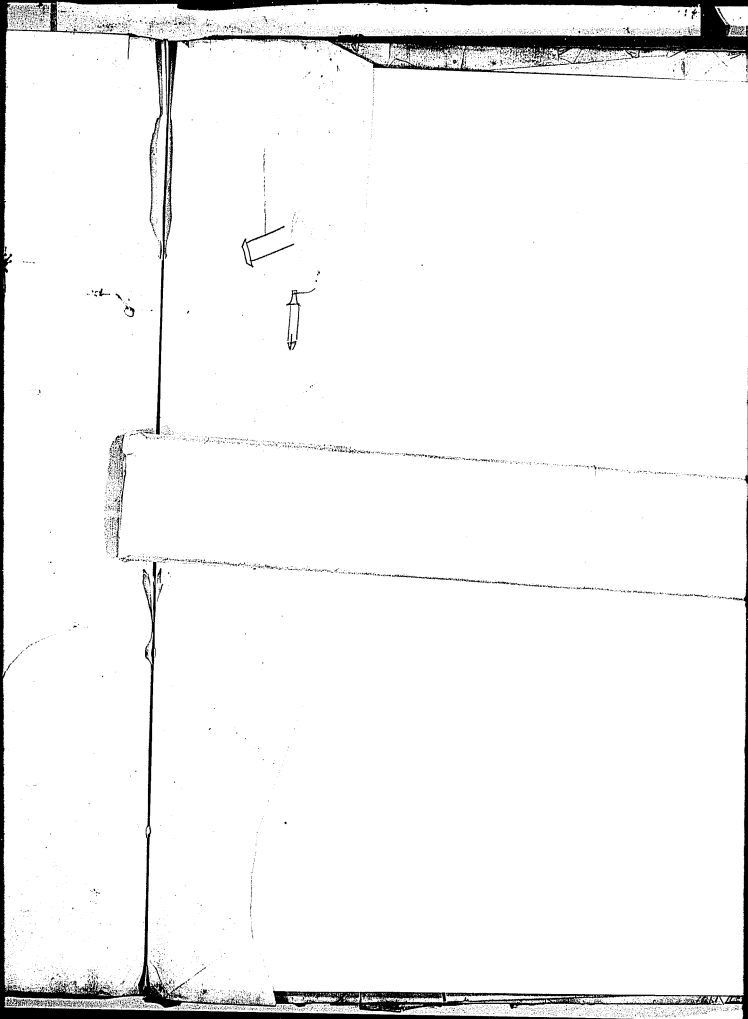
2 Switches #2 each

41 Cop Clocks 12 feet

27 Wet paper reels

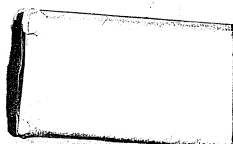
10 Relays

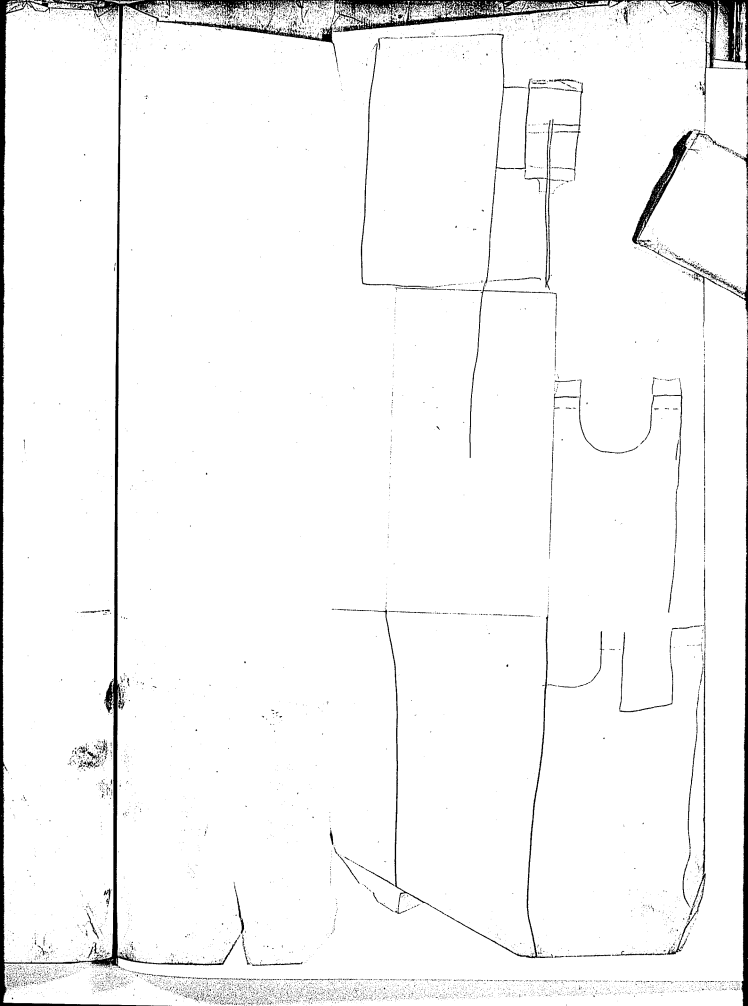
48. Bind parts large

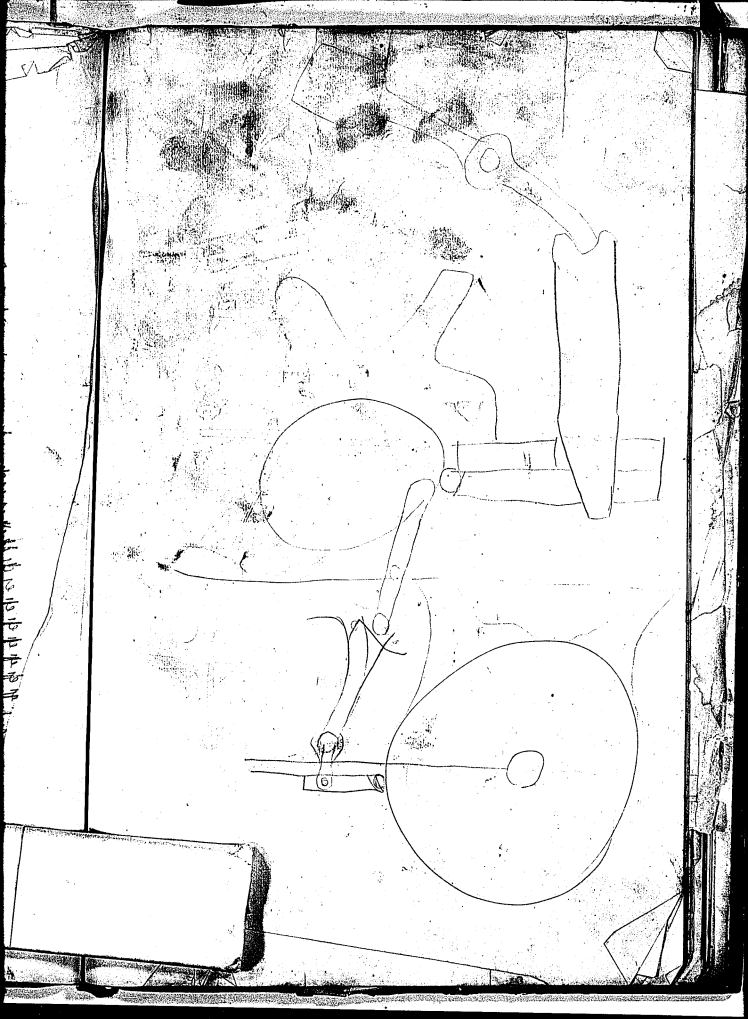


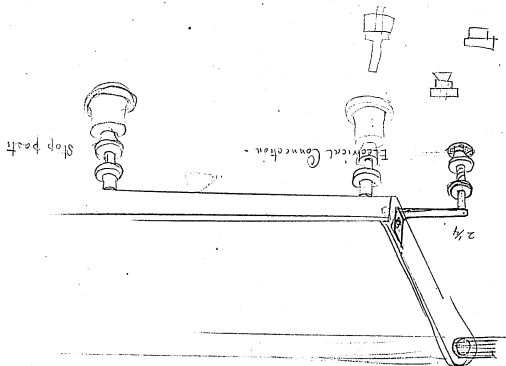


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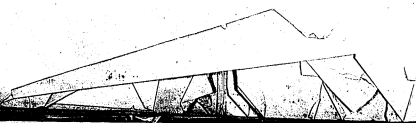
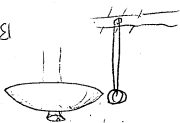


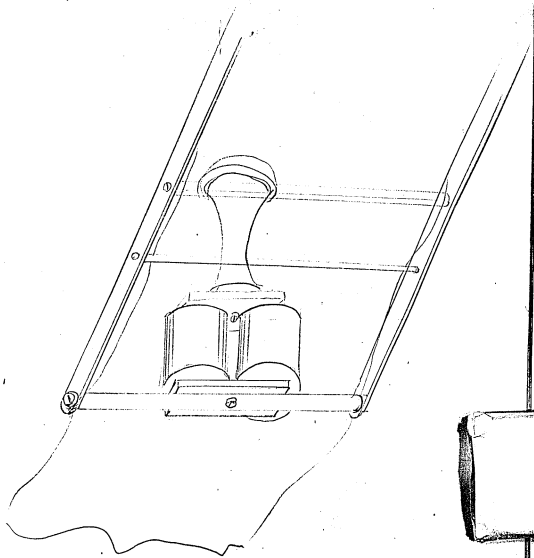


adjusting spring on
 rubber case

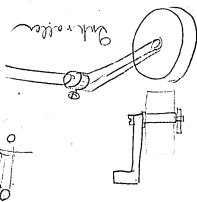


Bell.

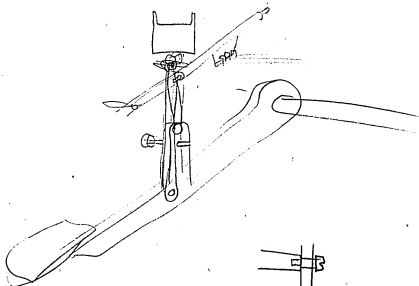
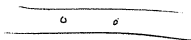
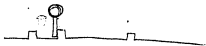
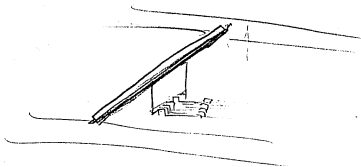


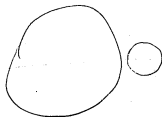
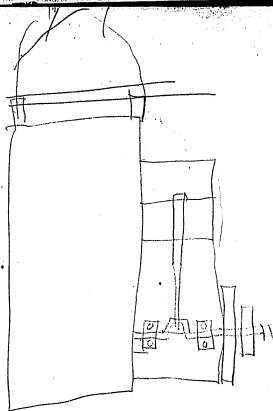


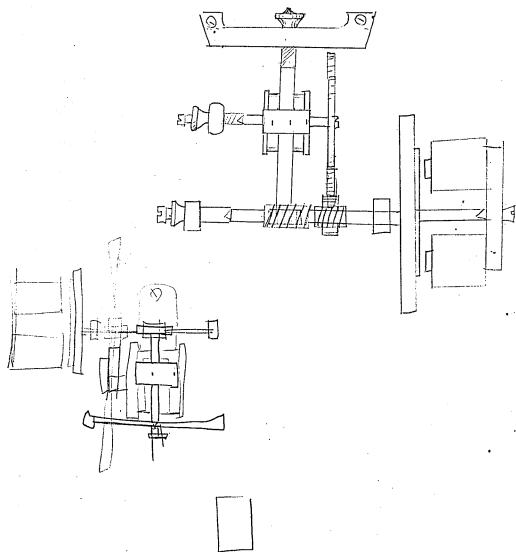
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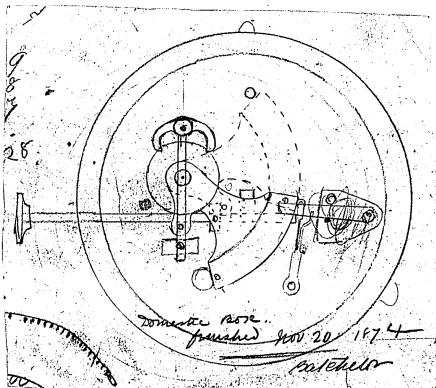


Book roller

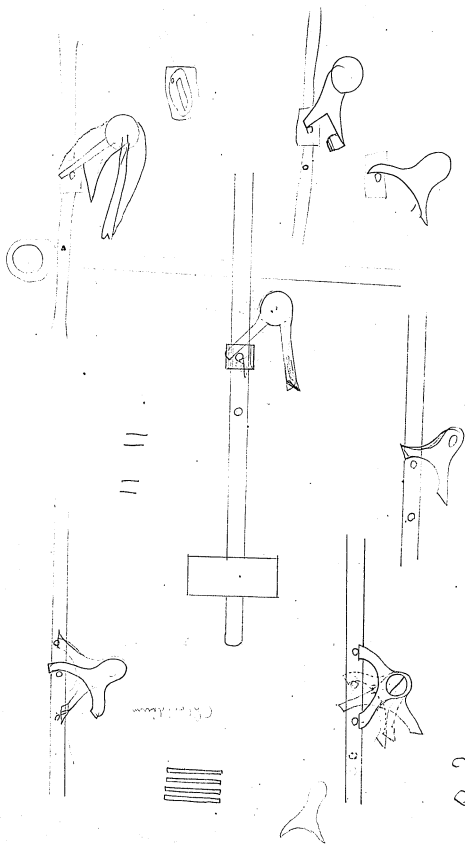


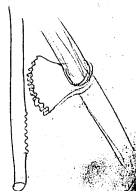
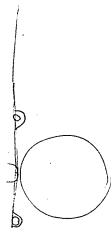


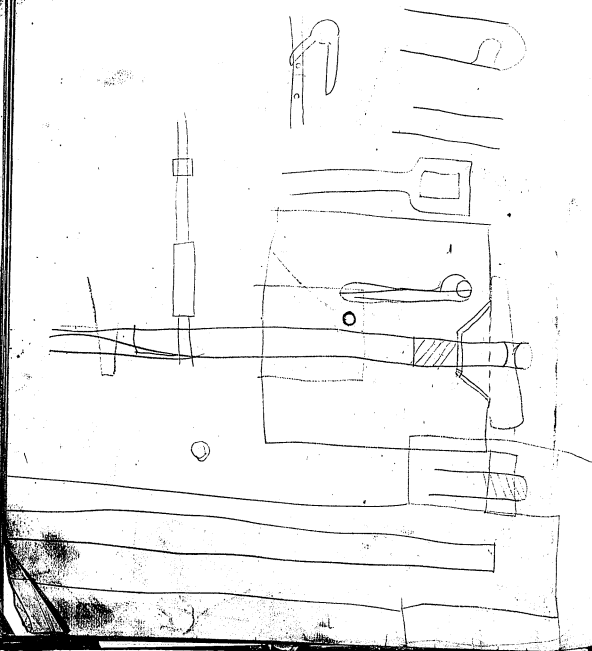


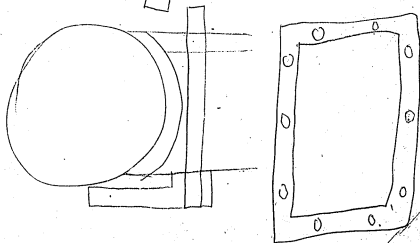
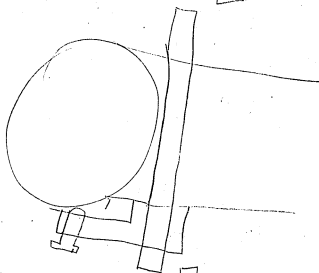
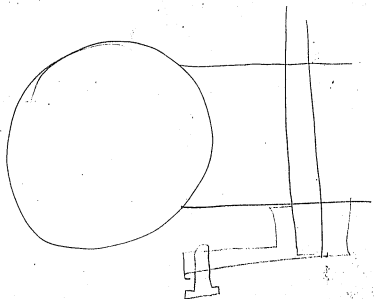


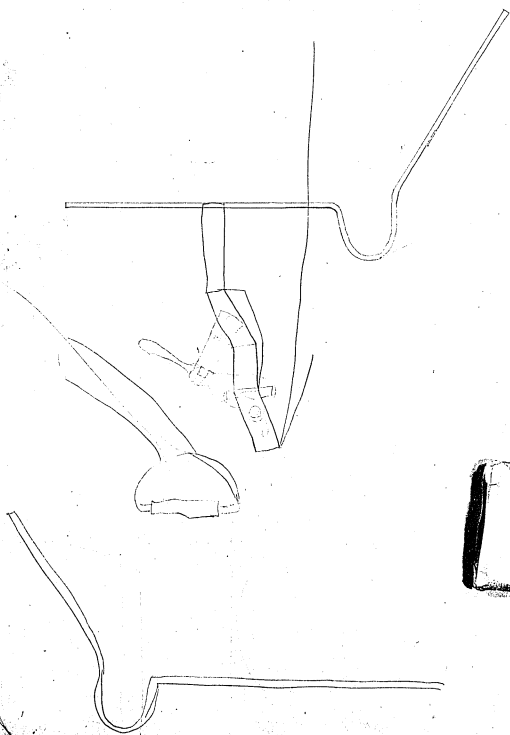
[ITEM FOUND IN BOOK]

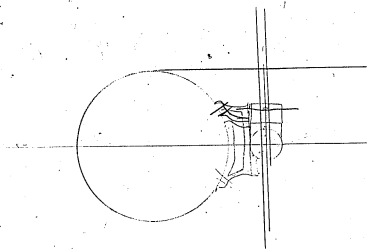


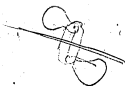
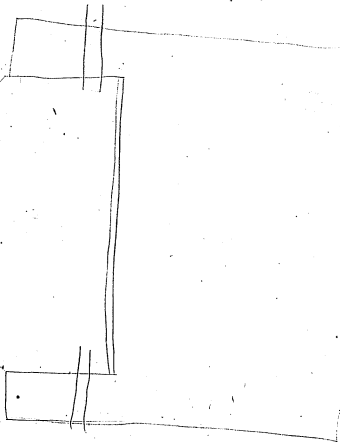
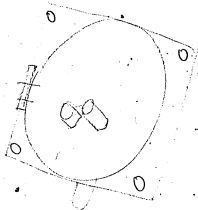


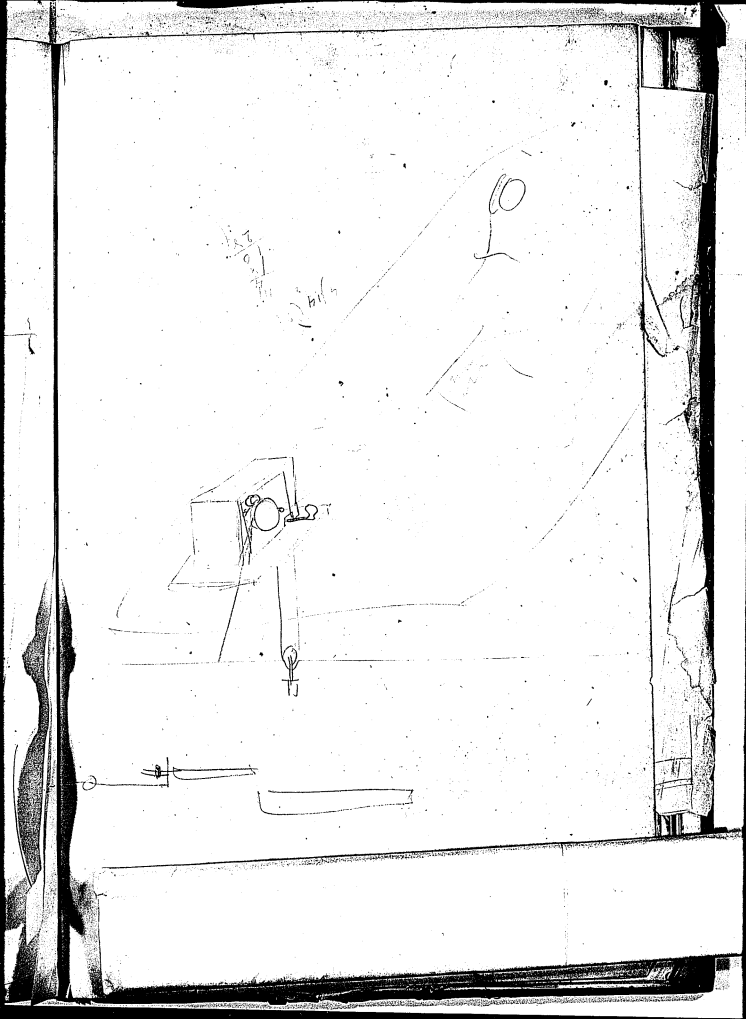


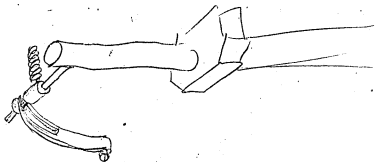
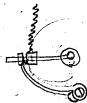
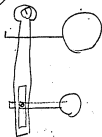
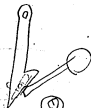
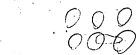


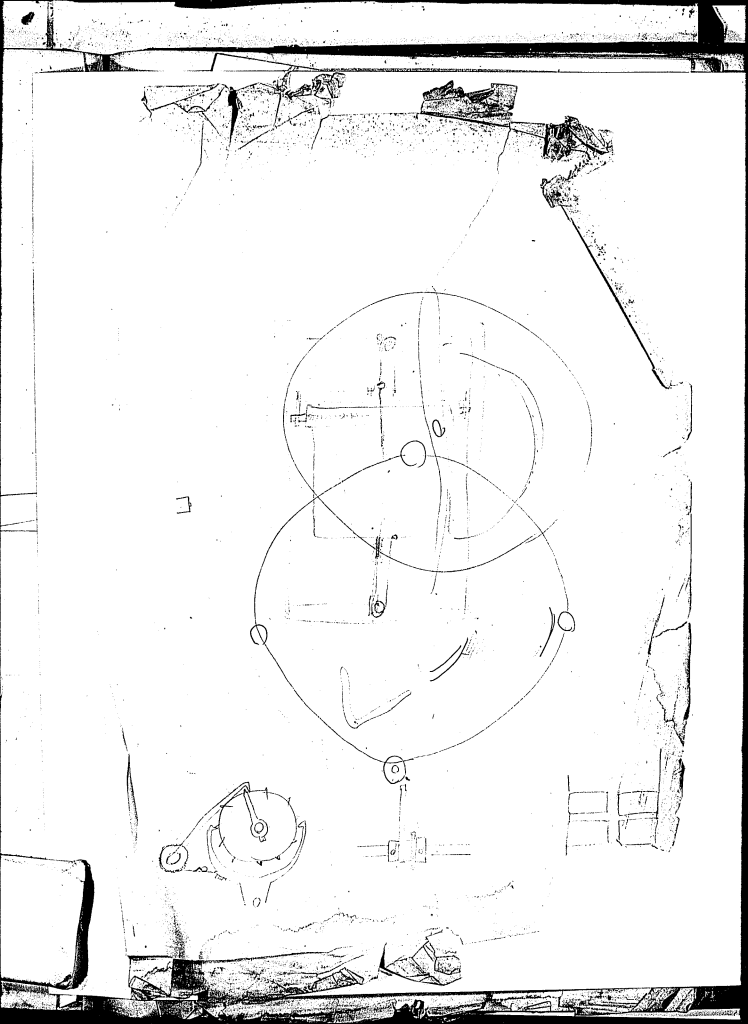


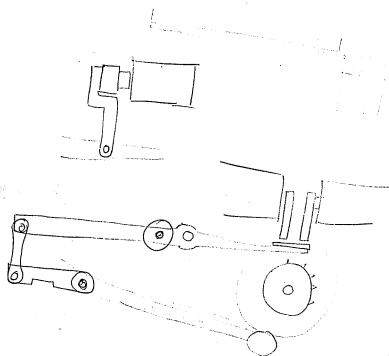




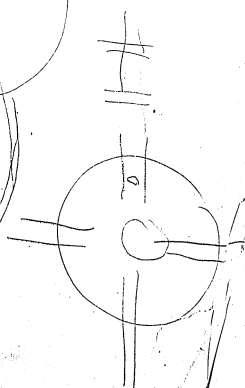
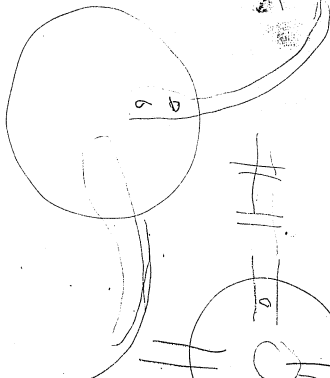
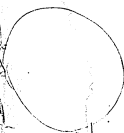
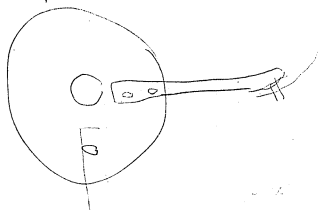


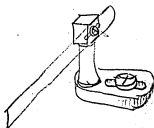
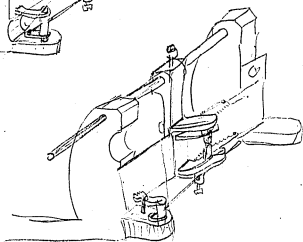
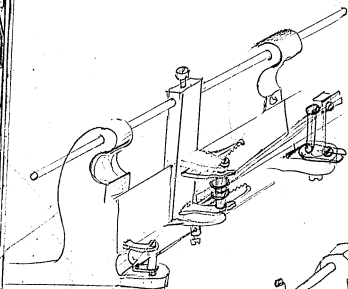




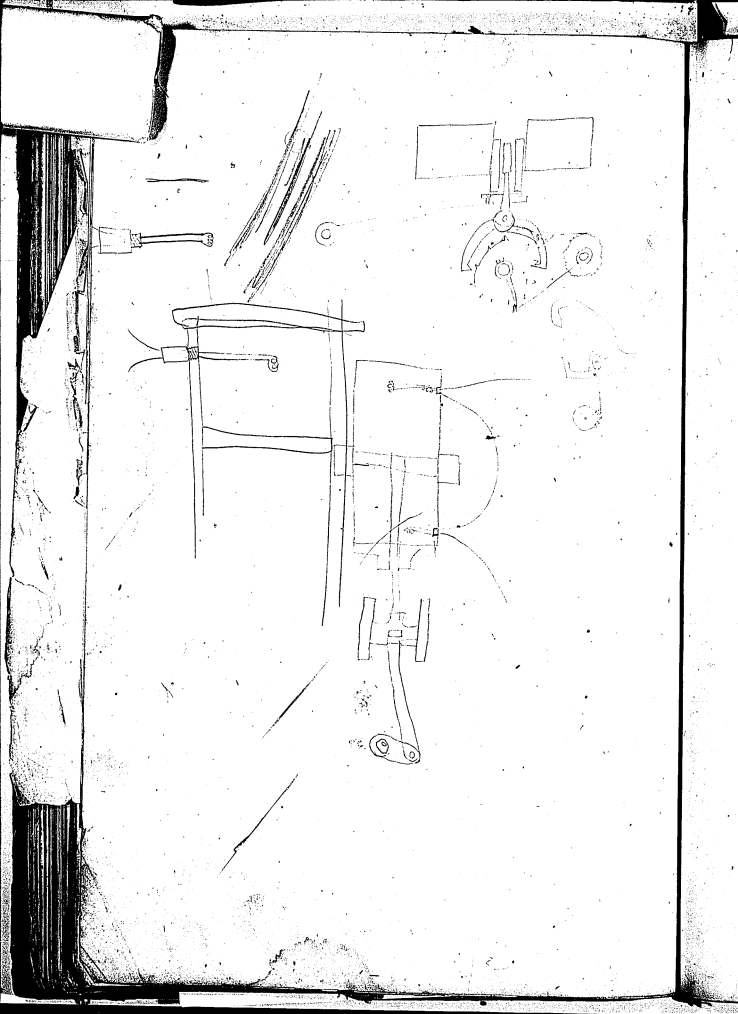


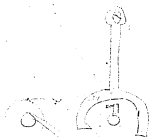
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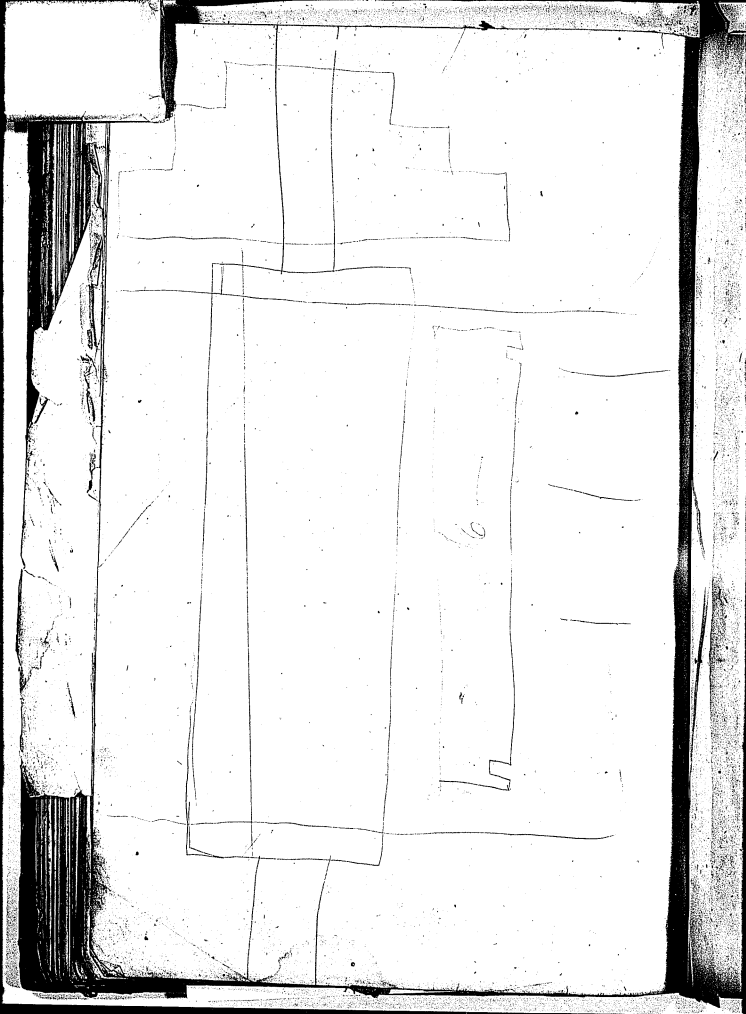


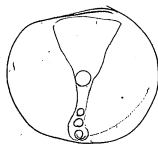
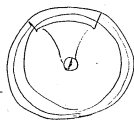
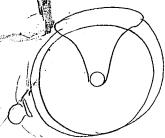








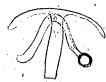
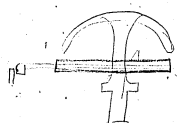
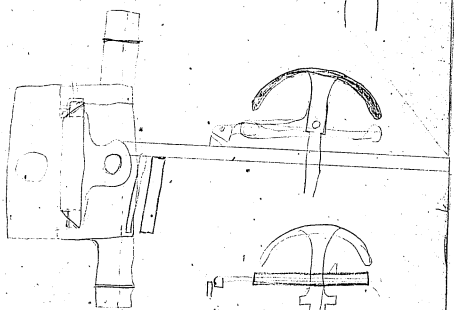
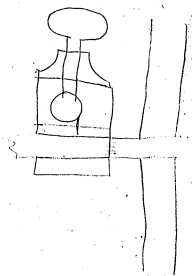
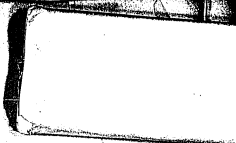




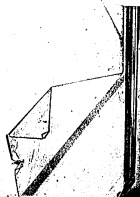
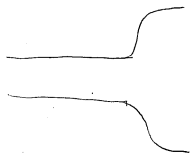
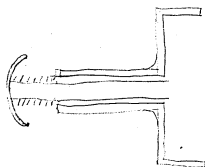
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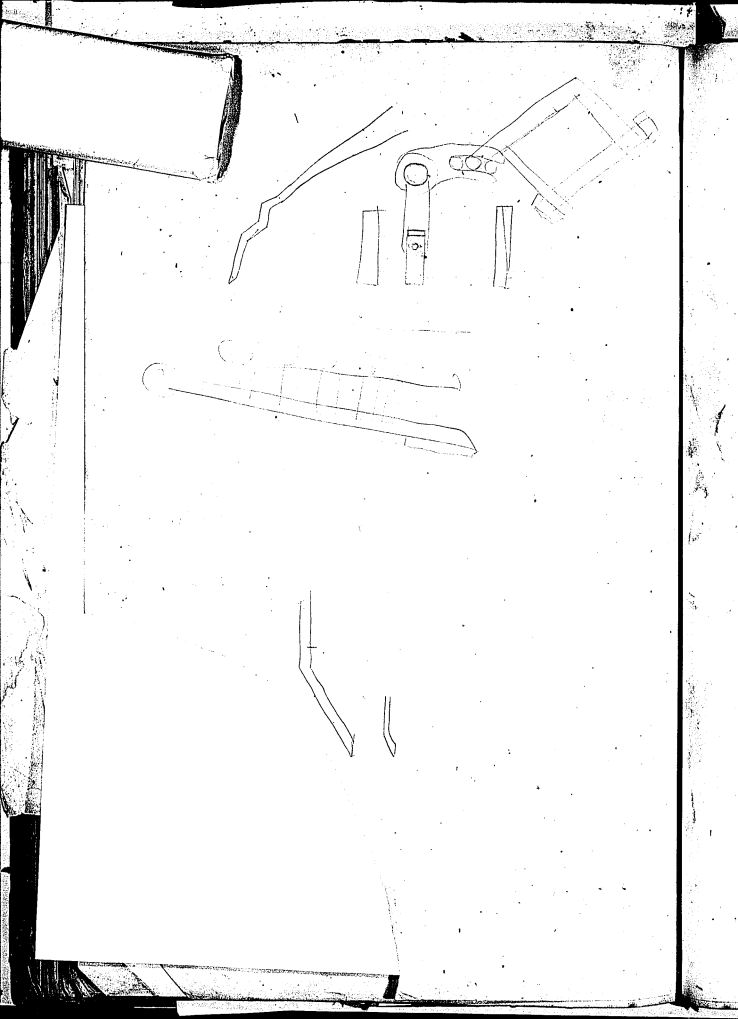
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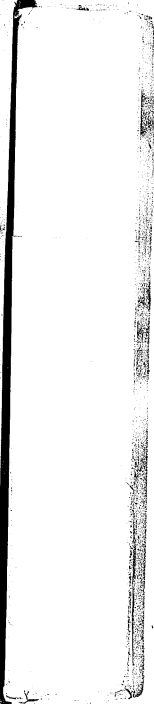
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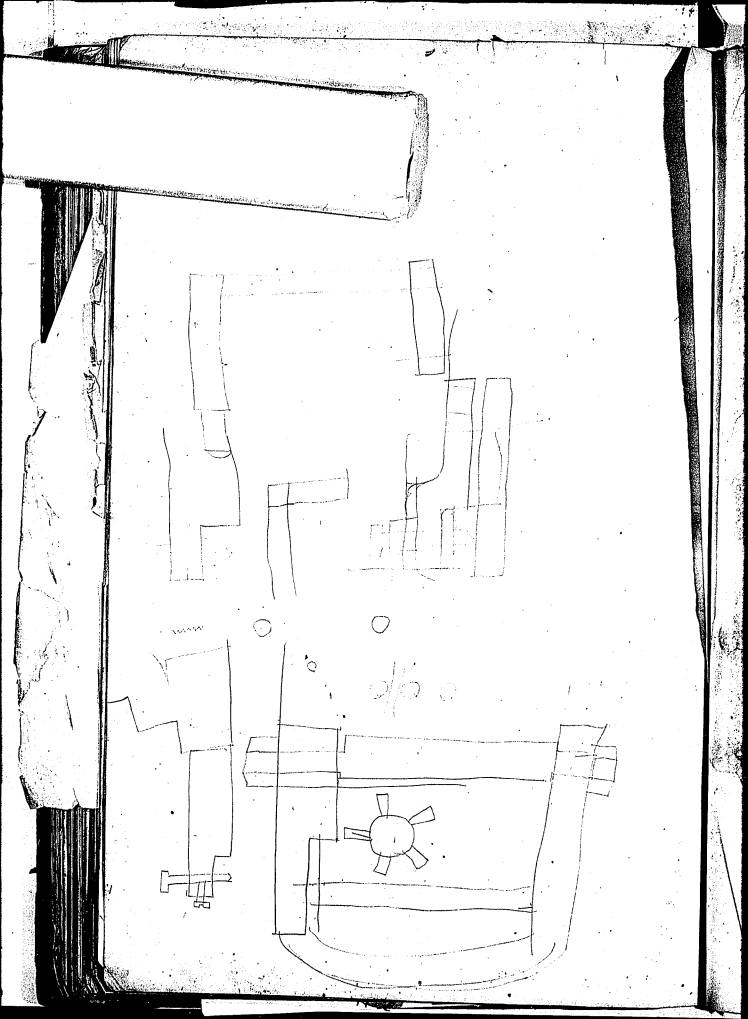


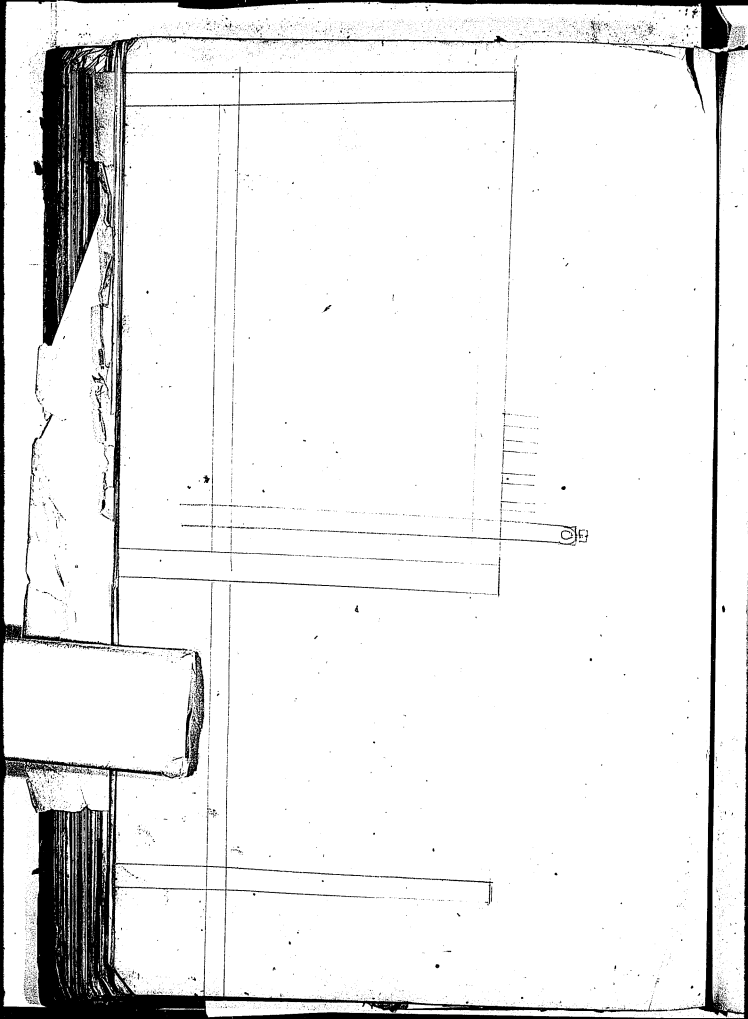


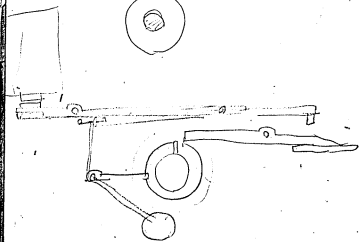
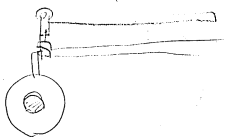
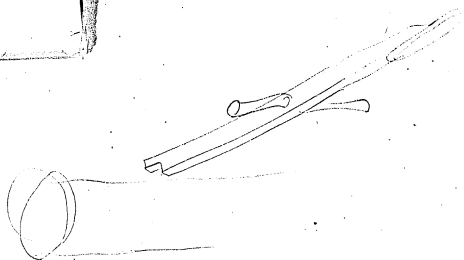
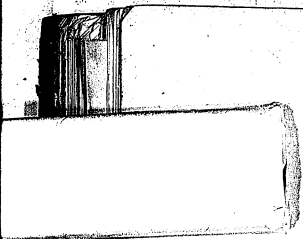


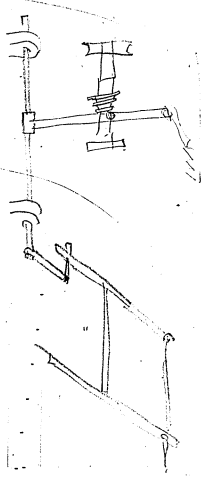
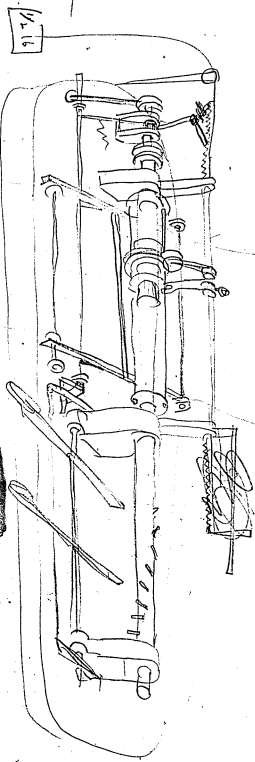
1/2 1/4

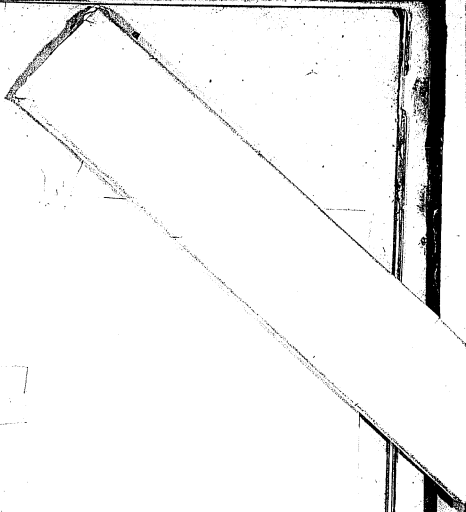
1/2 1/4



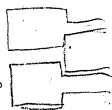
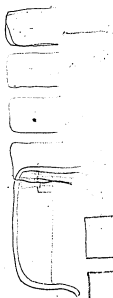






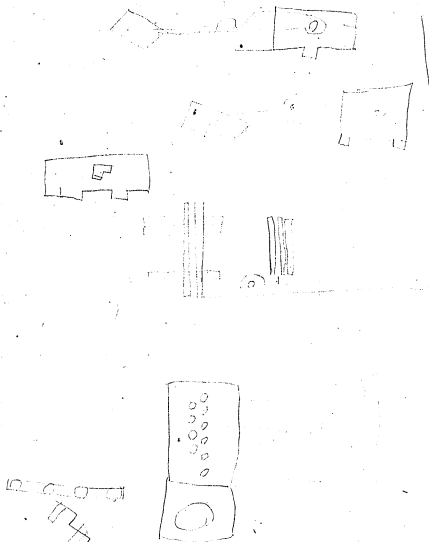


13
4
12
3

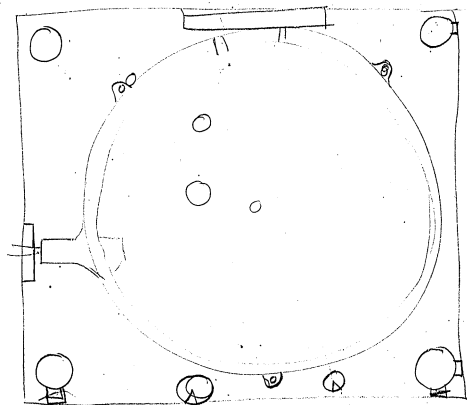


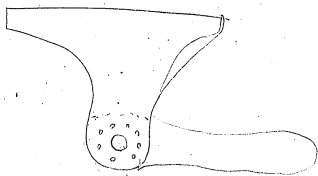
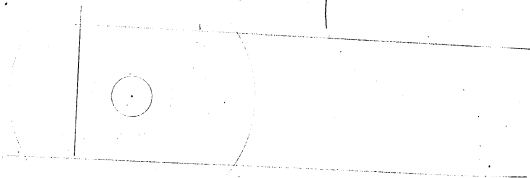
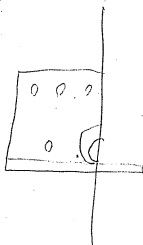
AUTOMATIC GRAPHIC

Made by AMERICAN TELEGRAPH WORKS, NEWARK

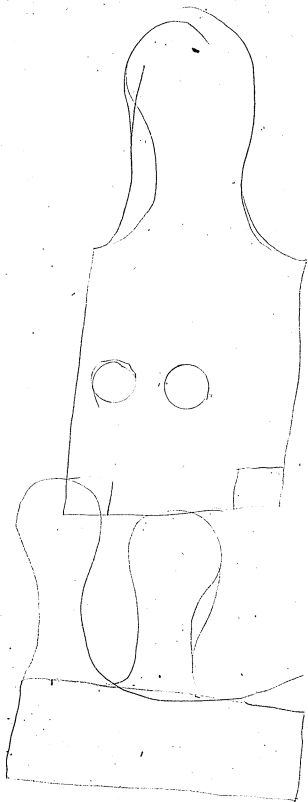


Drawing of
 the pump
 and
 the engine



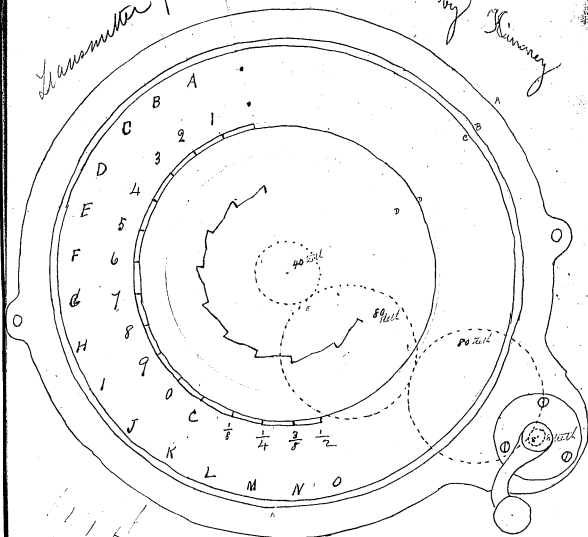


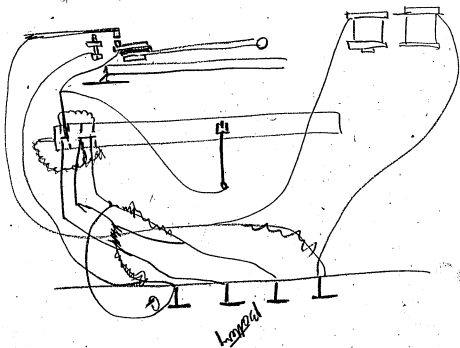
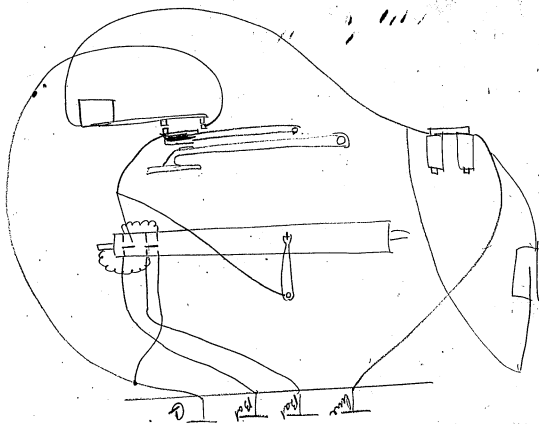
A
 B- $8\frac{3}{4}$
 C- $8\frac{3}{4}$ large program.
 D- $5\frac{1}{2}$ sledge of trial.
 E- $17\frac{1}{2}$ balance - Gross.
 F $2\frac{1}{2}$ - -
 G $1\frac{1}{4}$ - -
 H
 I
 J
 K
 L
 M



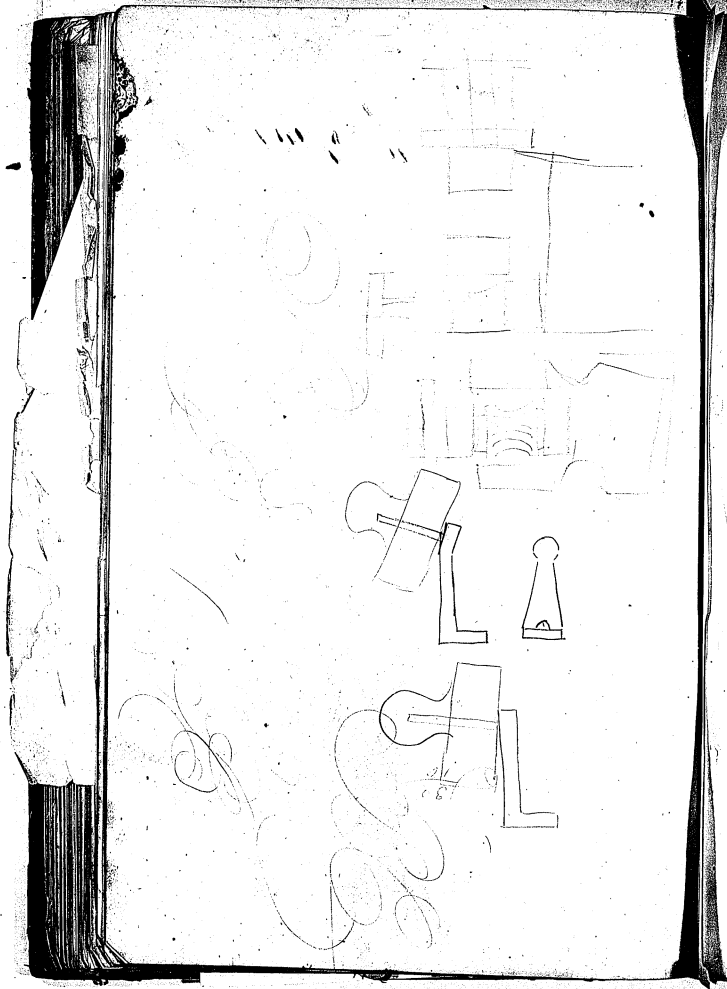
Transmitter for Stock Printer

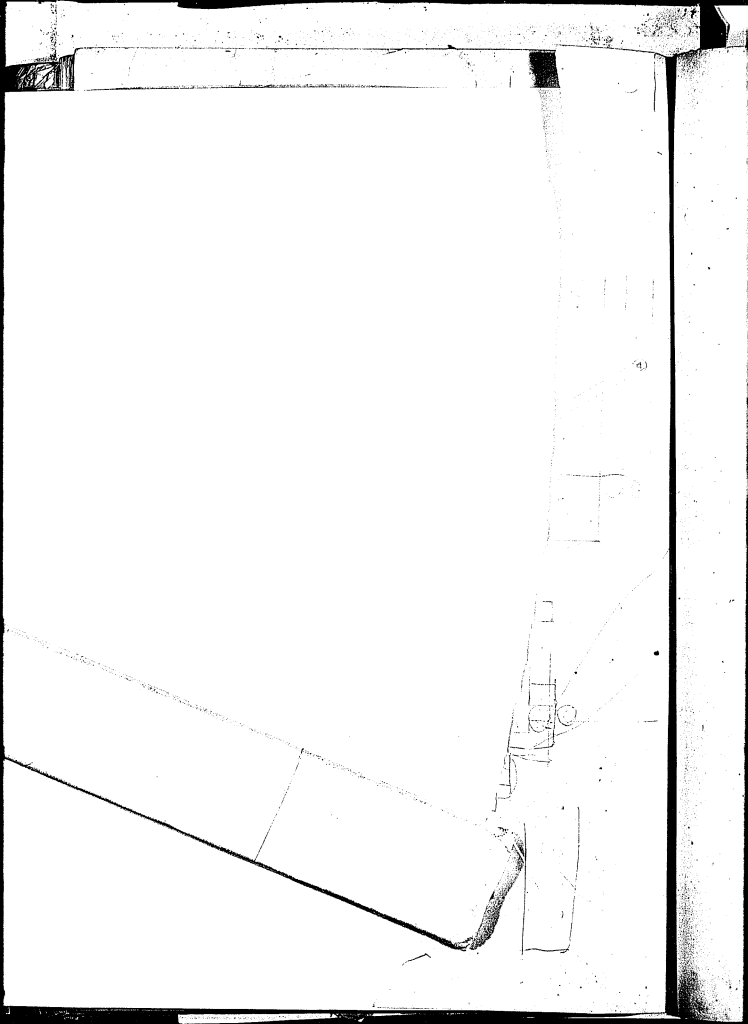
Made by Jimmy





57
01





H. idem Sept. 156 ^{cont.} of 1700
H. idem & *H. idem* 181 ^{cont.} of 1700

Adrian Higgins 181 Elmwood St. 11

1895-1896

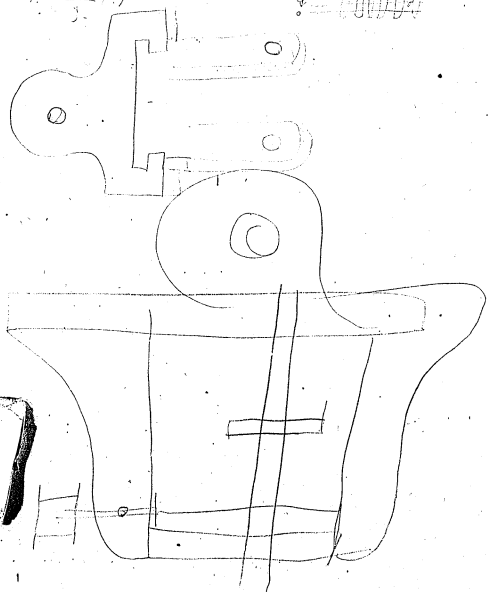
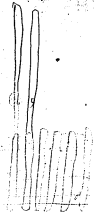
Fluoride - 922 Hazardous or Toxicity

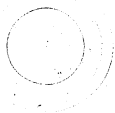
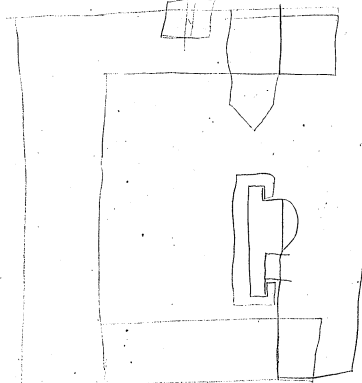
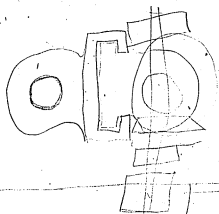
[Faint handwritten notes at the bottom of the page]

Alison Smith & Robert Smith

1/11/77
5.40.11

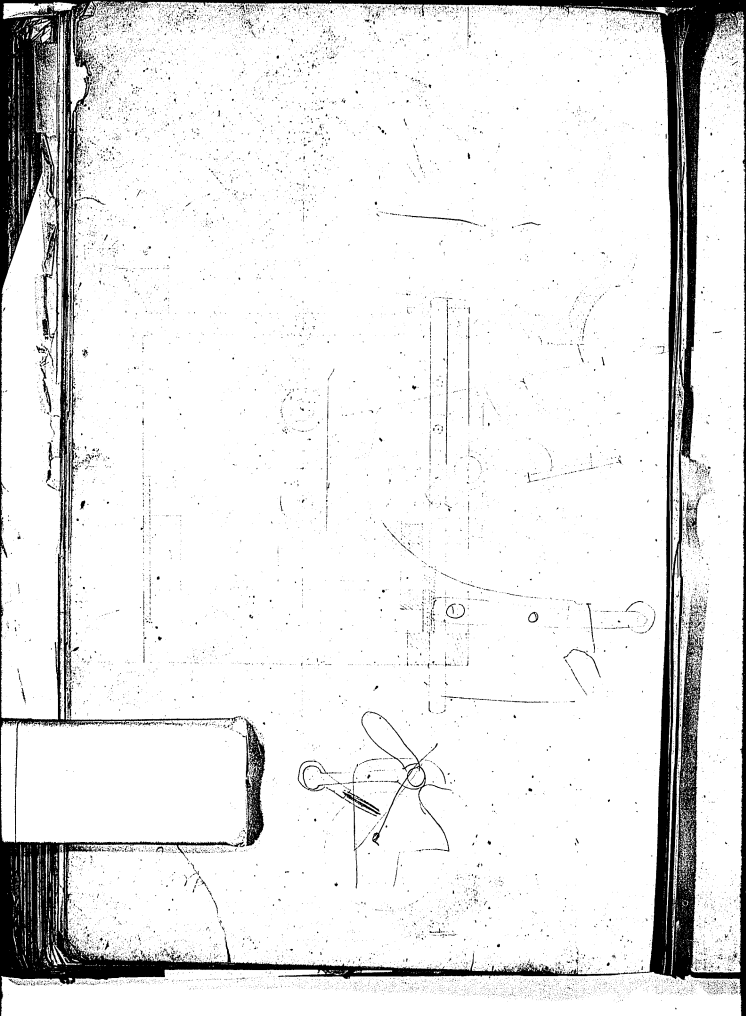
5.40.11

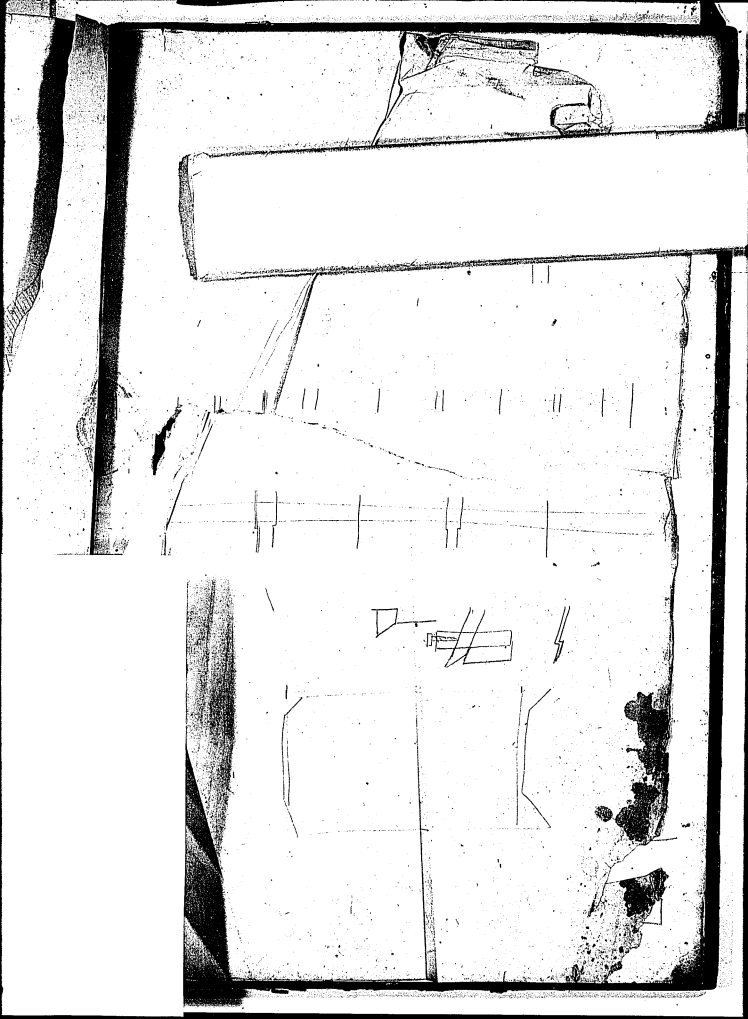


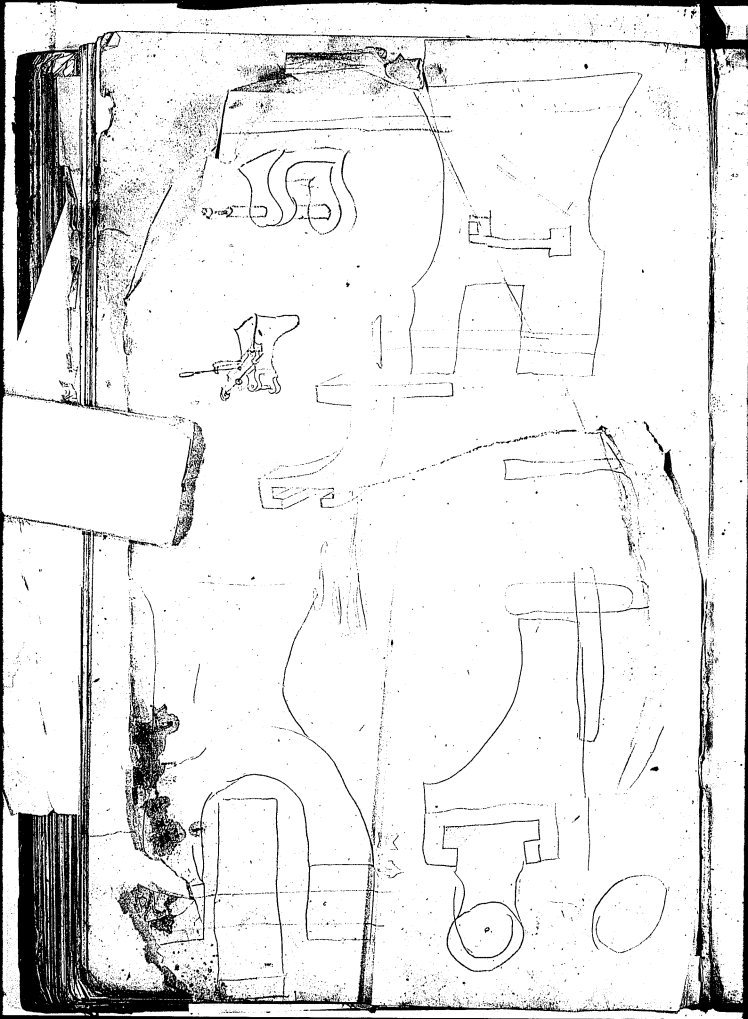


14. 11. 1914

St. Joseph's Convent







9.4.2: 105

1451942
200

$$\begin{array}{r} 105 \\ 145 \\ \hline 250 \end{array}$$

435

57416

18-00-0-67
15-7088
2-231
2-612

2/2/2017

3.14.16
9.11.16

16. 21

$\begin{array}{r} 1805 \\ \times 2 \\ \hline 3610 \end{array}$

$$\frac{2}{3}$$

1000

5.73

573

34

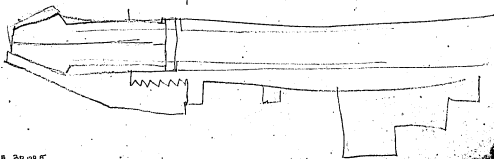
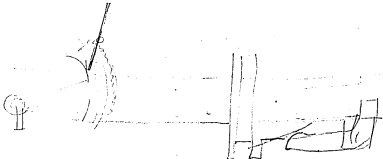
1784
15-54
12-1-24
10-8-1
8-5-1

22

— 10 —

20

5.64



Laboratory Notebook, Cat. 1169

This notebook covers the period March 1875-November 1876. The book was begun by Charles P. Edison, who inscribed the first page: "C.P. Edison Newark New Jersey March 10th 1875." The only other dated entry in the first part of the book is for October 5, 1876. Most of the material relates to telegraph apparatus. Included are circuit diagrams, drawings of instruments (especially printers, sounders, and keys), and calculations. There are also cartoons and doodles.

The second part of the book contains signed drawings by Thomas A. Edison, along with a few by James Adams. The drawings relate to multiple and acoustic telegraphy, and the few dated ones fall between September and November 1876. In addition to the drawings, there are clippings and advertisements about electrical apparatus and steam engines, and an obituary of Marshall Lefferts.

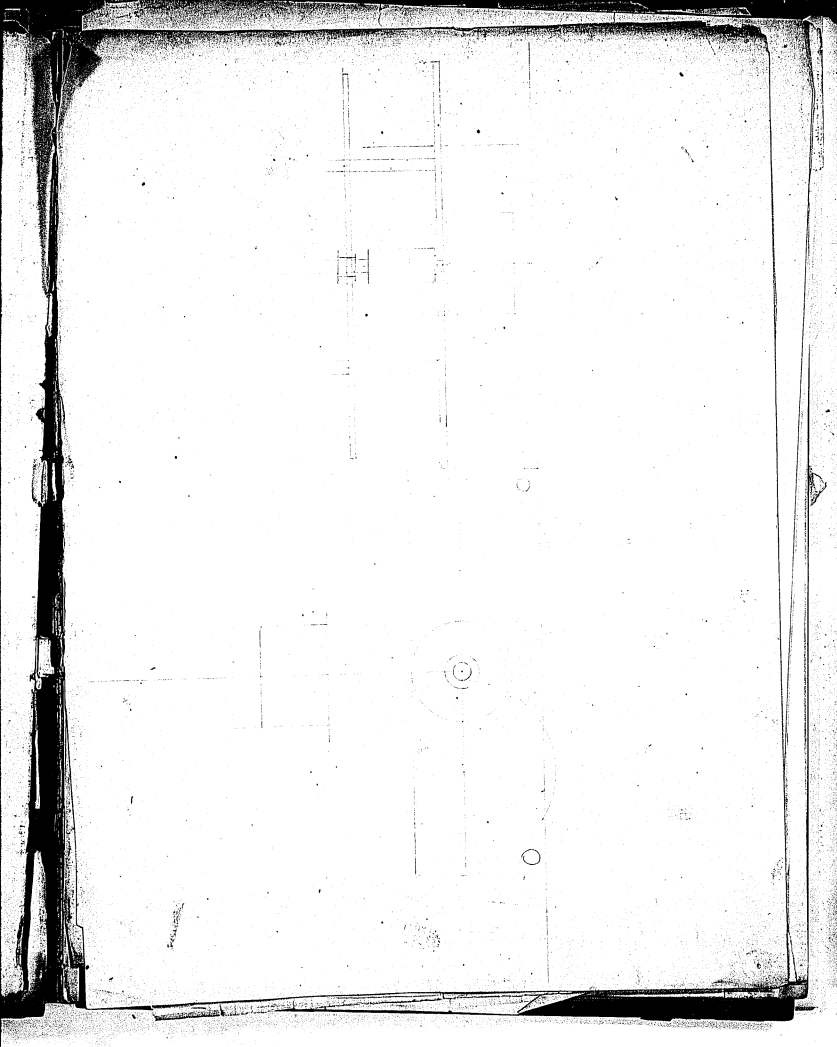
The book contains 157 numbered pages, preceded by seven unnumbered leaves. The number 151 has not been used. Many leaves were apparently torn out before the pages were numbered.

C. P. Edison

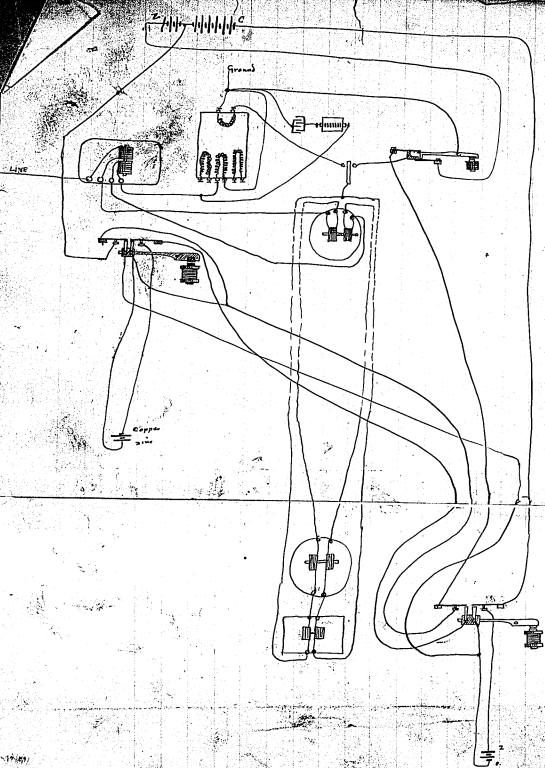
Newark.

New Jersey.

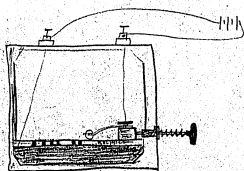
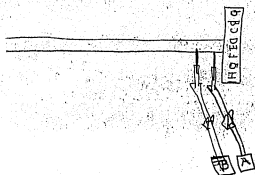
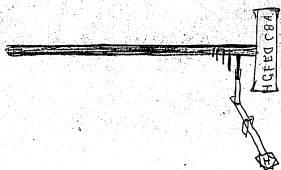
March. 7th 1875

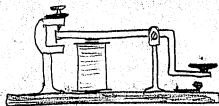




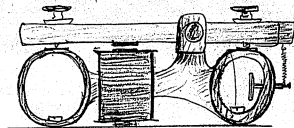




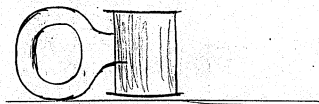


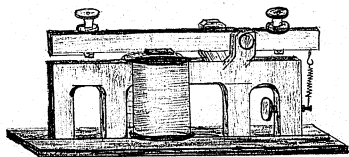


the good,
- 3 no 3

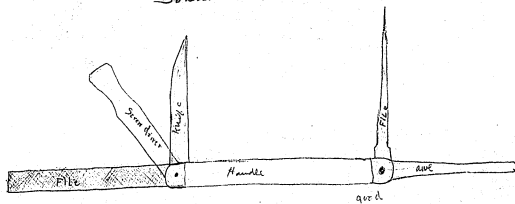


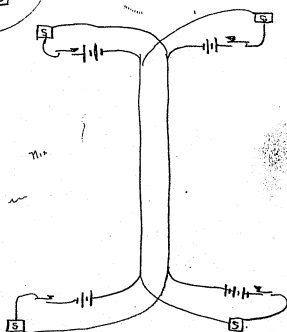
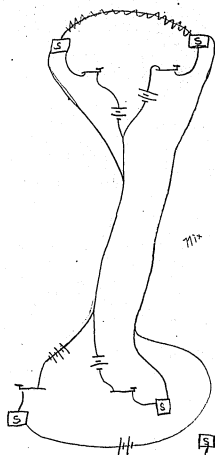
Sonder H





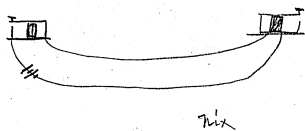
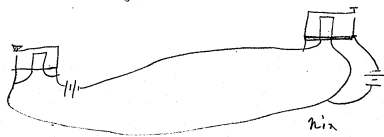
Sander No 6 - good

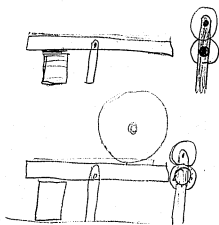
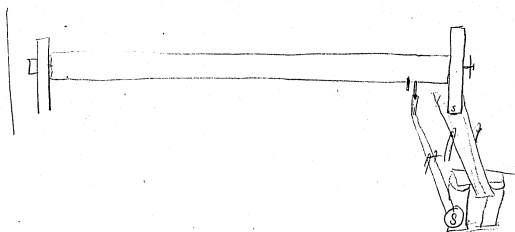




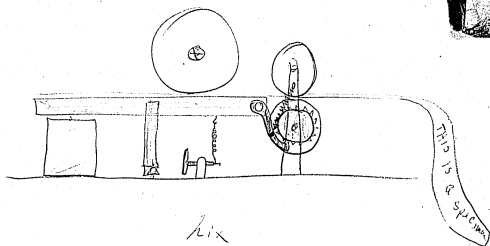


St. John's Singers





W.P.C. Dison

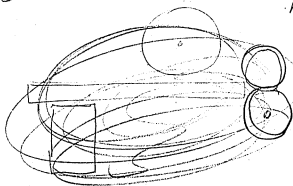


C. Pedison

hix

hix March. 21st

C. Pedison



shon

C. Pedison

C. Pedison

C. Pedison

C.

C. Pedison

W.P.C. Dison

W. Pedison

W.P.C. Dison

C. Pedison

C. Pedison

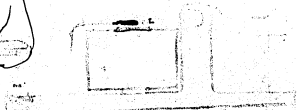
C. Pedison

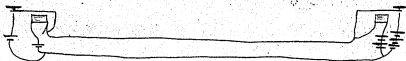
C. Pedison

[THE NEXT FOUR PAGES ARE BLANK]

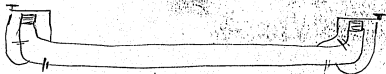


No 2.
No. C good

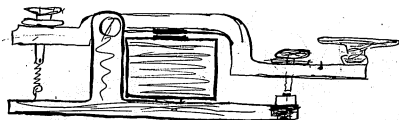




no much mix

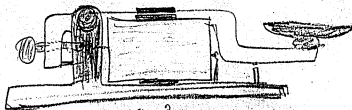


When there are a circuit in the magnet it closes the contact points, on the key, and cuts out the magnet so it is mix



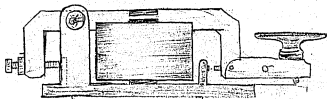
Sounder & key no 1
good

177



54 H. No 3

gooder Red Hot Bully



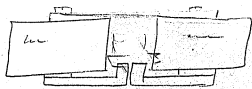
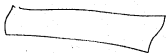
207h

207h

207h

207h

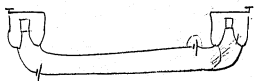
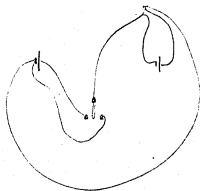
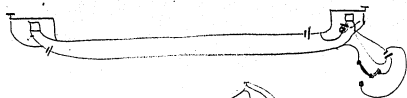
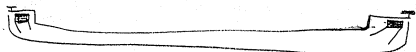
207h



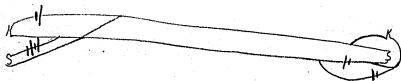
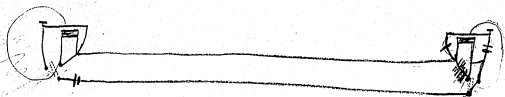
1.1



207h



5'45" over



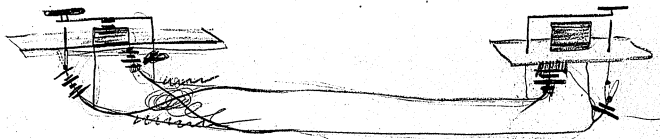
16,000
1,000
1,000,000
1,200,000

[THE NEXT TWO PAGES ARE BLANK]

~~Red Dot Bulb~~ April 16th 1875 27



7m



26
2
1
1
2
1
2
2
2
2

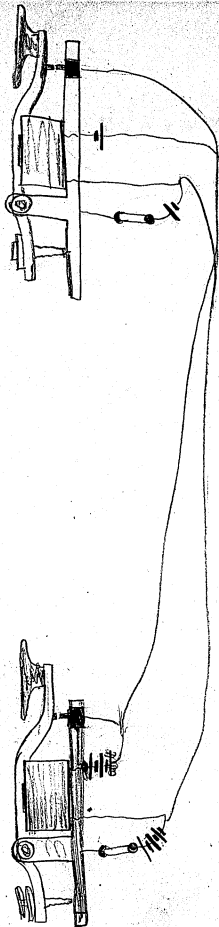
51

3000
500
25000
51
25810
3100
2550
22700
650
3100

mmmmmm

13
50
650

51
13
64
50
3200
1750
4950



~~10,000~~
 10,000
 300
 500

 10,800
 1750

 9,050

|||||

36
 62

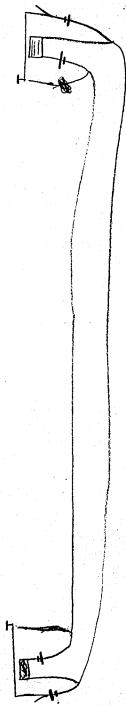
 1750

10,800
 25,800
 36,600
 4,950

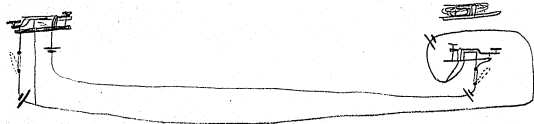
 38,650
 25,000

 6,650

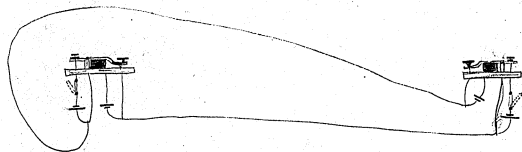
Boat. Red ~~tail~~ belly
nick



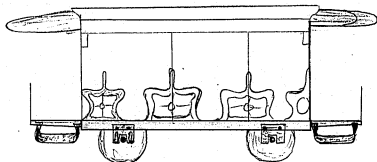
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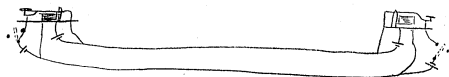
connections for. cleggson



connections for. cleggson.



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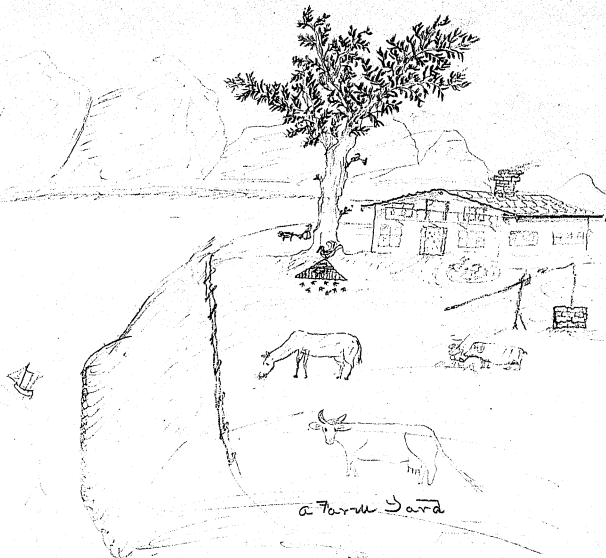


711

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a Farm Yard

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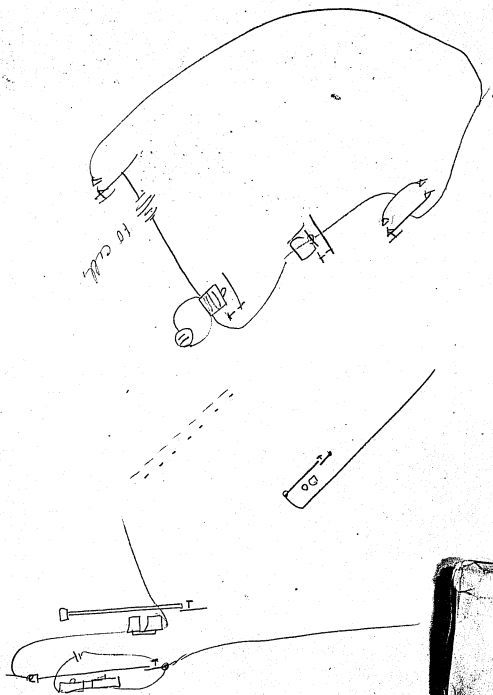
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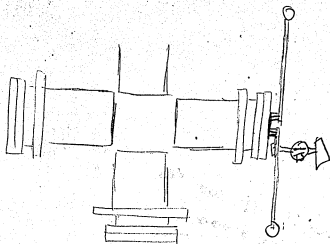


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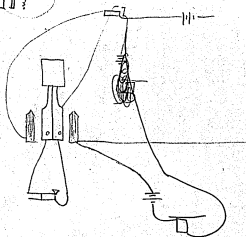
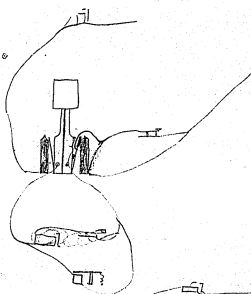
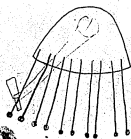
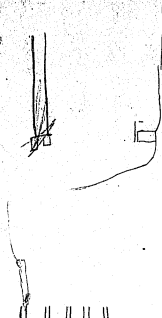
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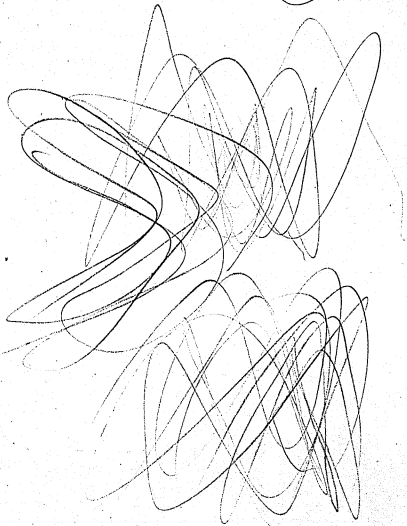
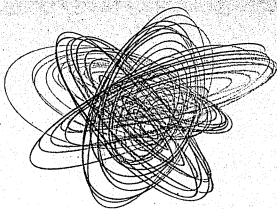


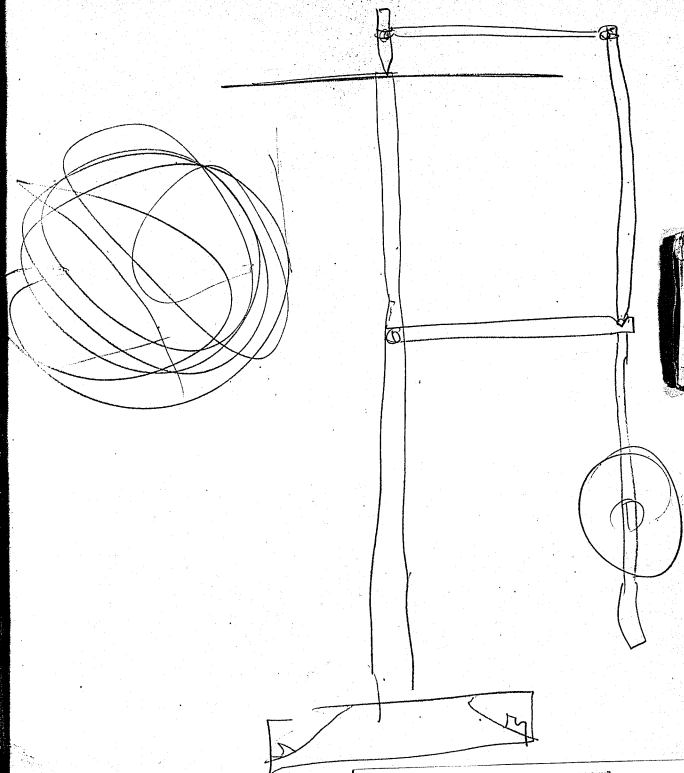
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[PAGES 56-69 ARE BLANK]



12

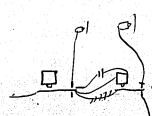
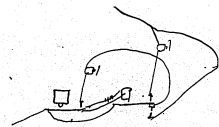
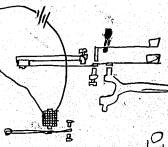
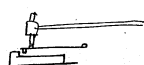
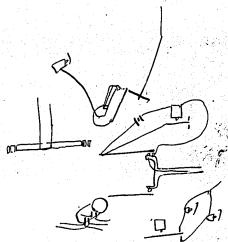
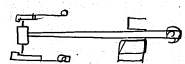
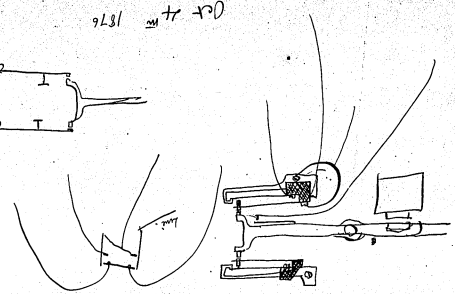
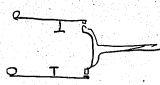




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James O'Connell

Oct 4th 1876



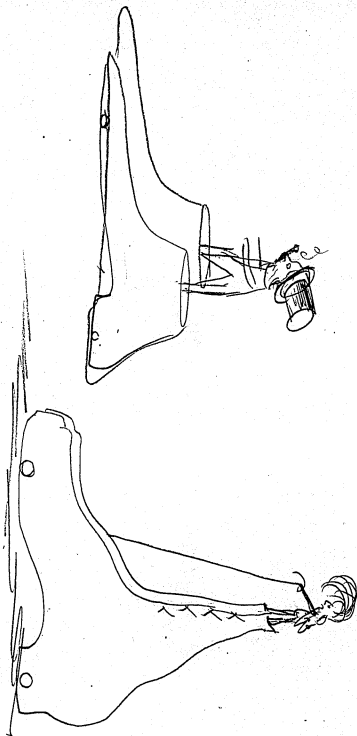
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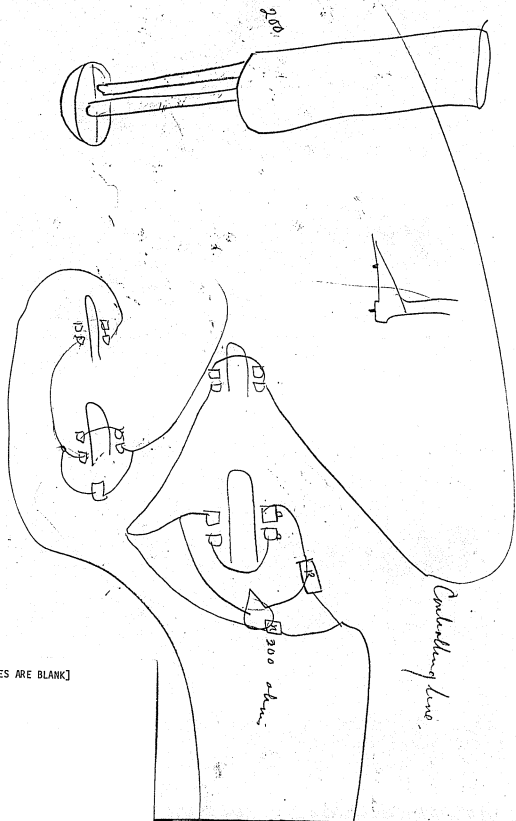
THE EMPEROR OF RUSSIA
son

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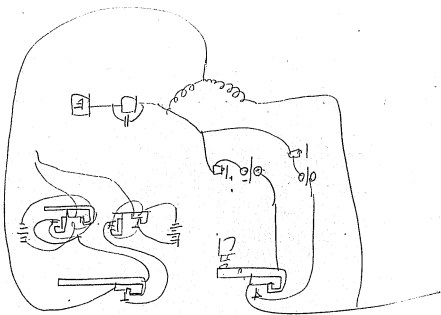
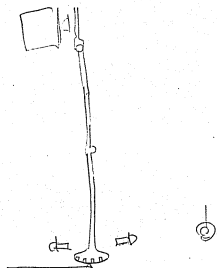
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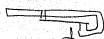
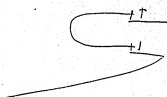
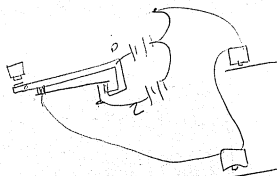
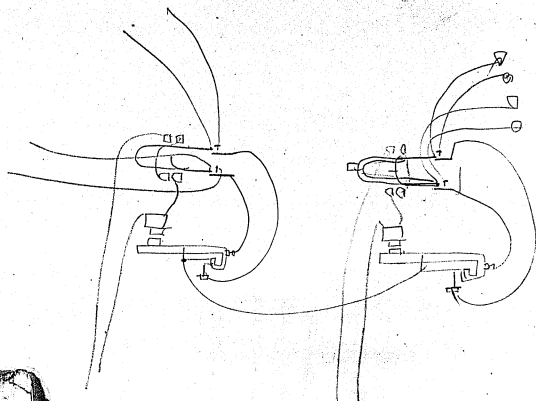


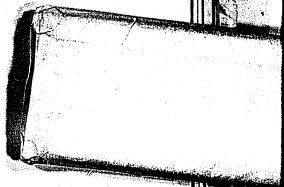
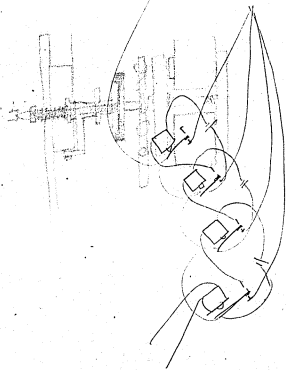
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96

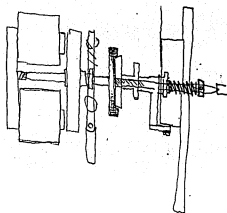






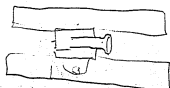


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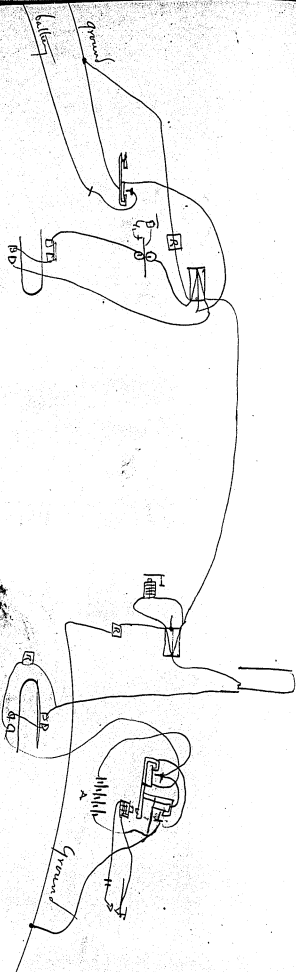
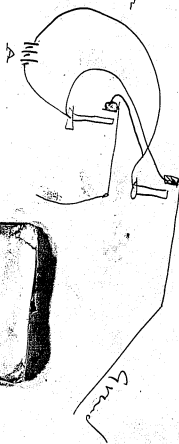
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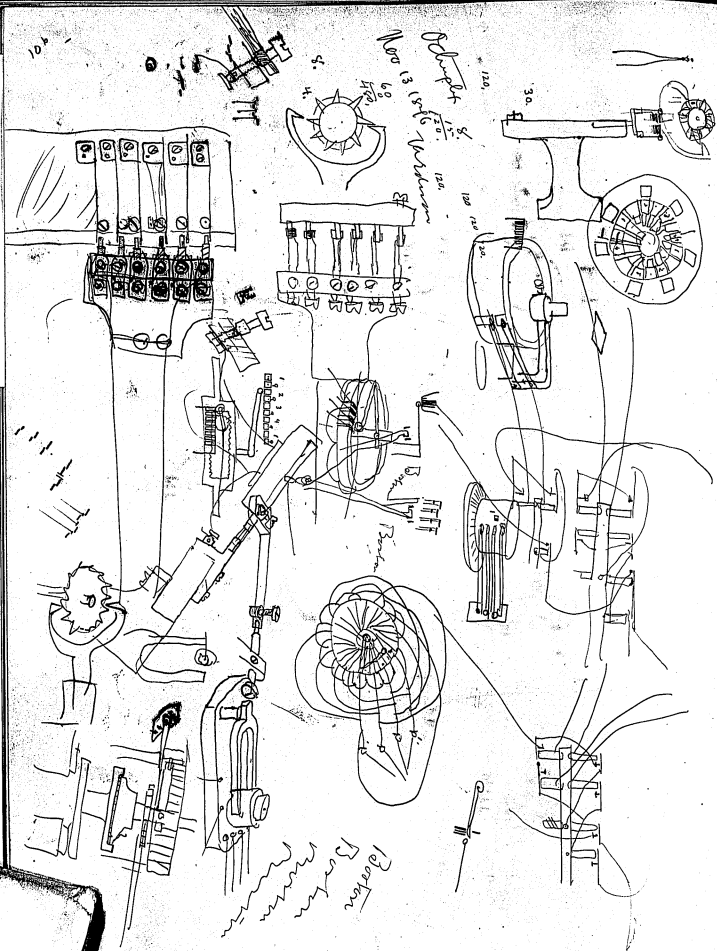


104

Controlling from lamp
switch with a wire

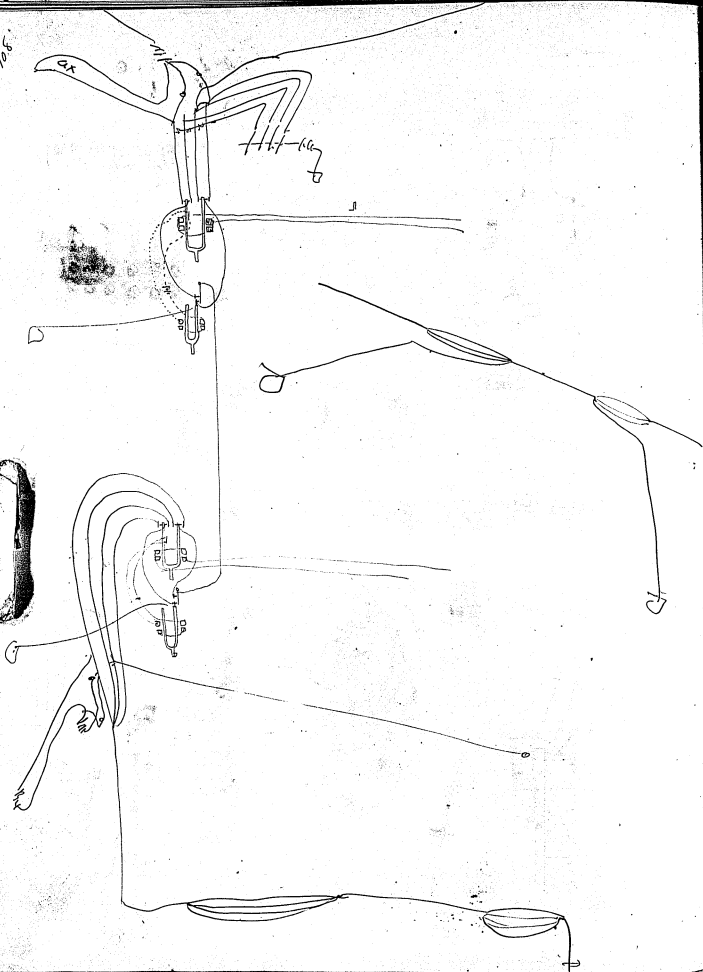


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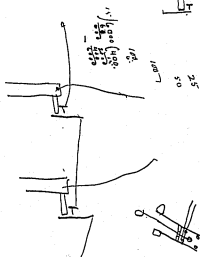
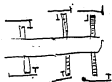
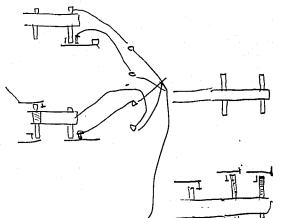


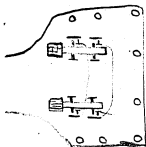
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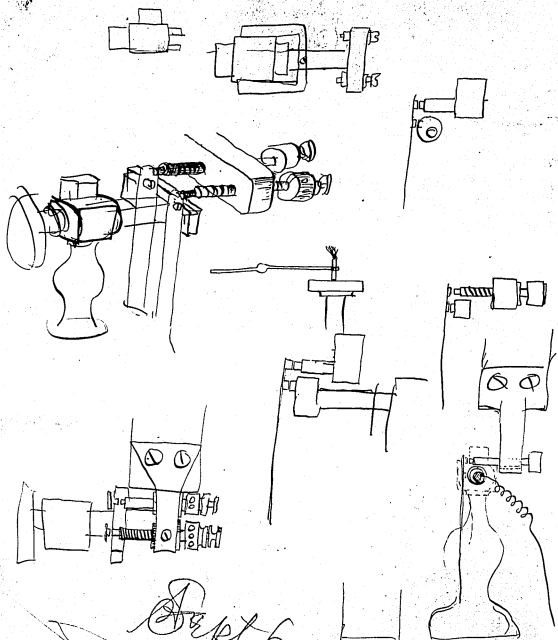


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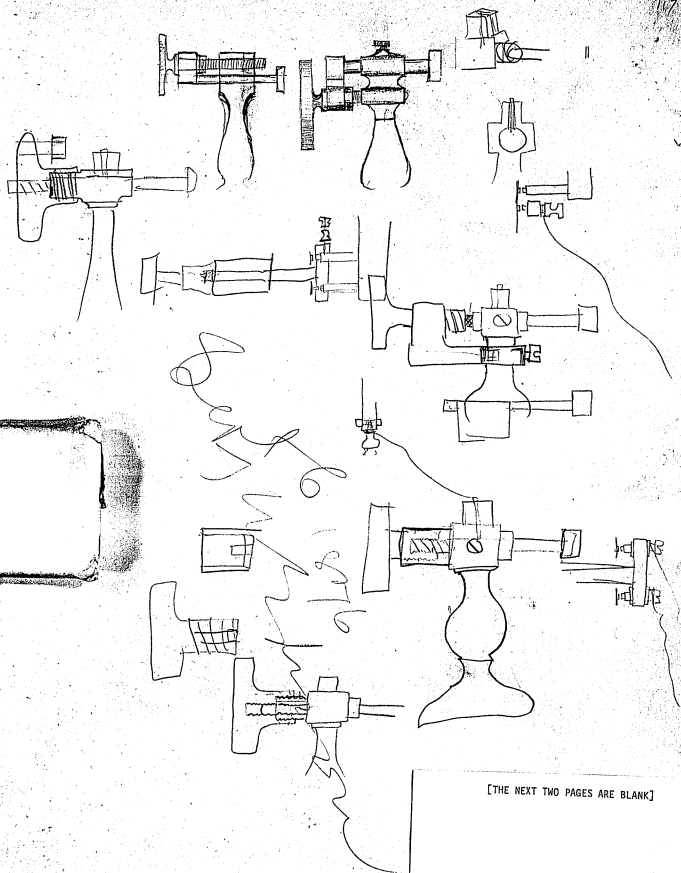




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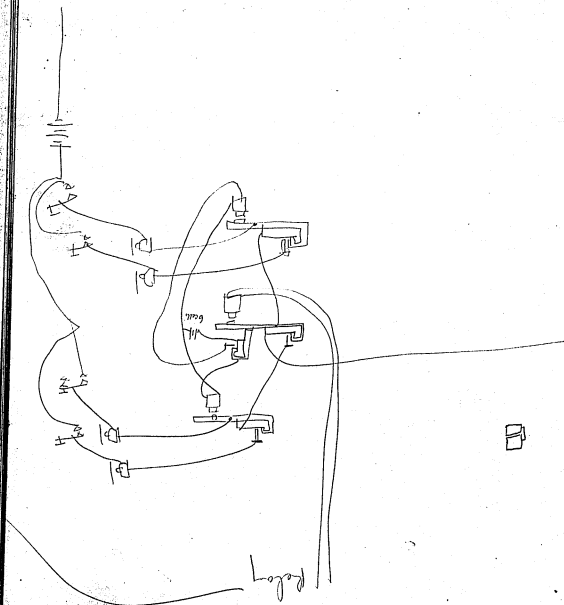


Sept 6
1896
J. L. Brown

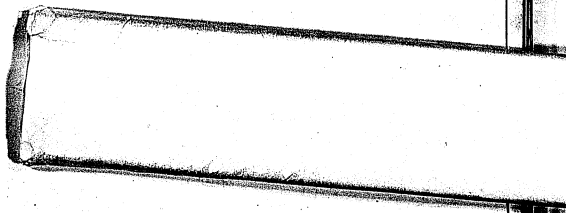
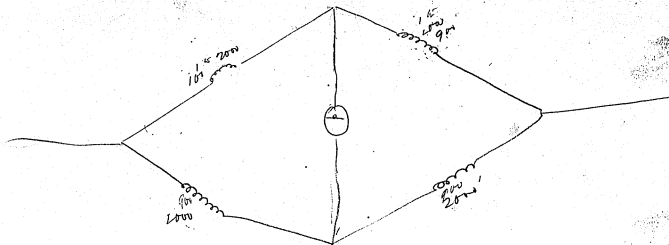


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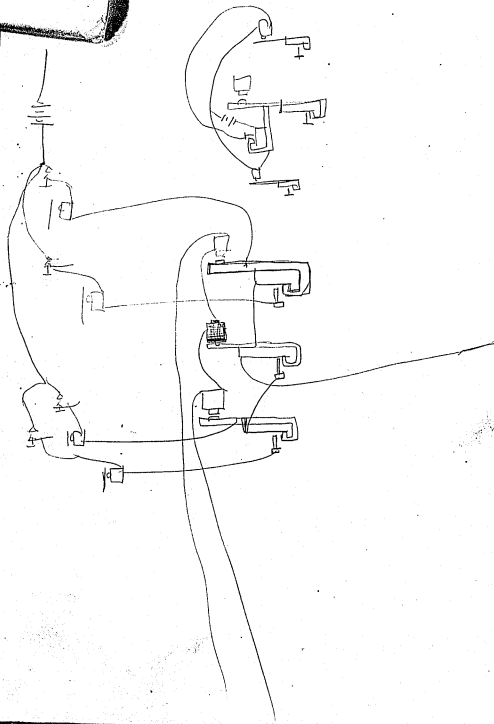
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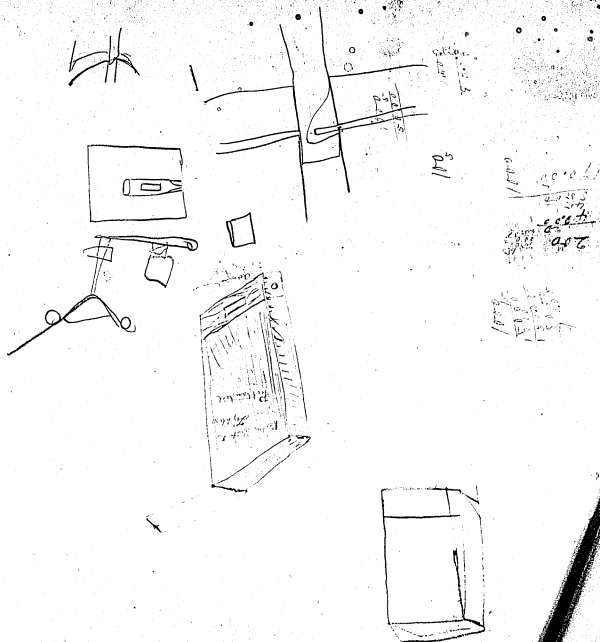


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122

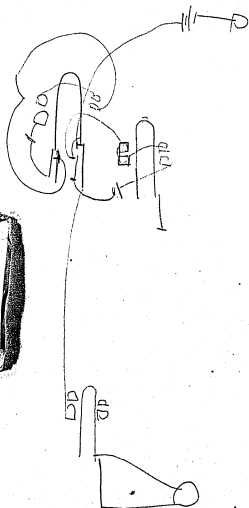




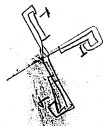
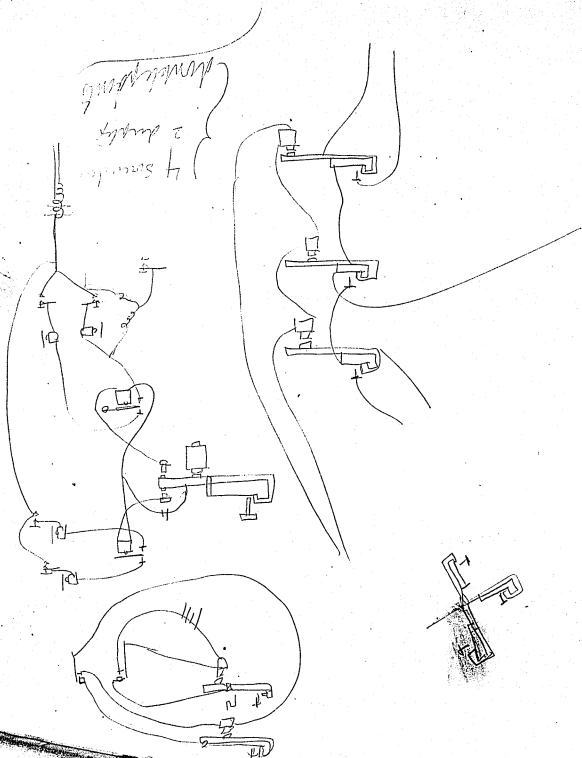
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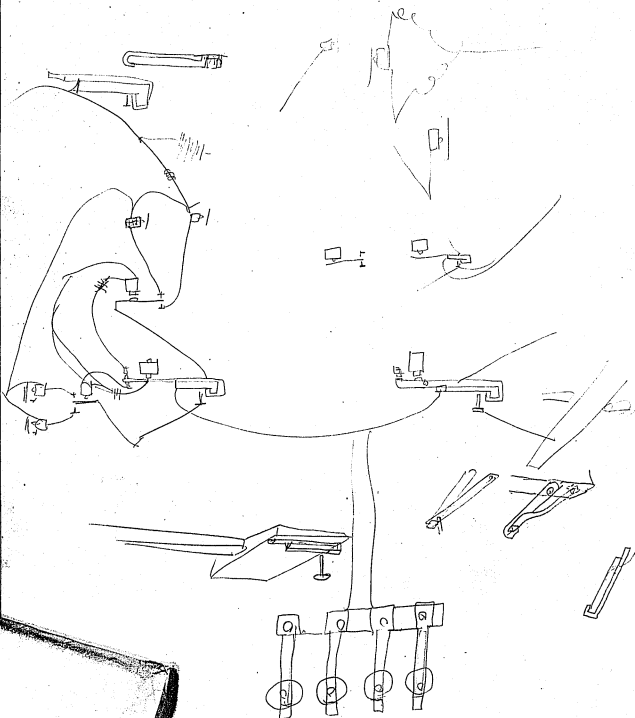
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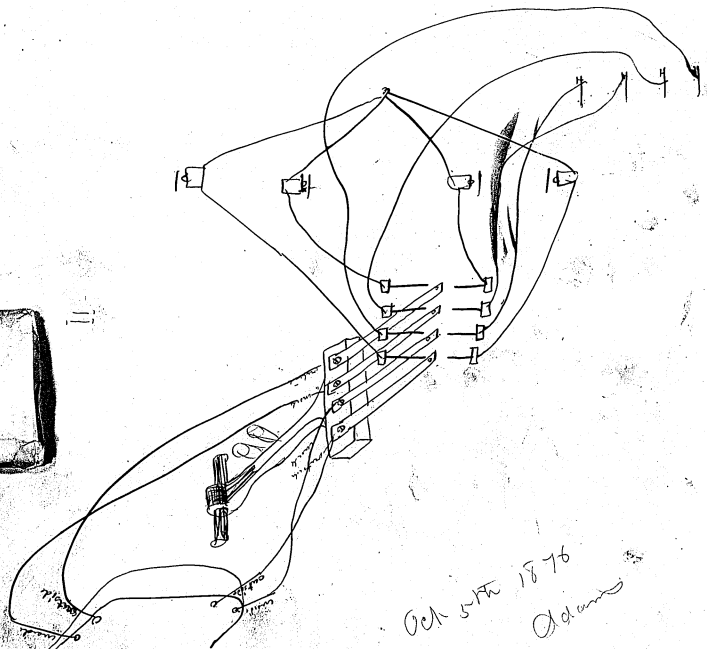
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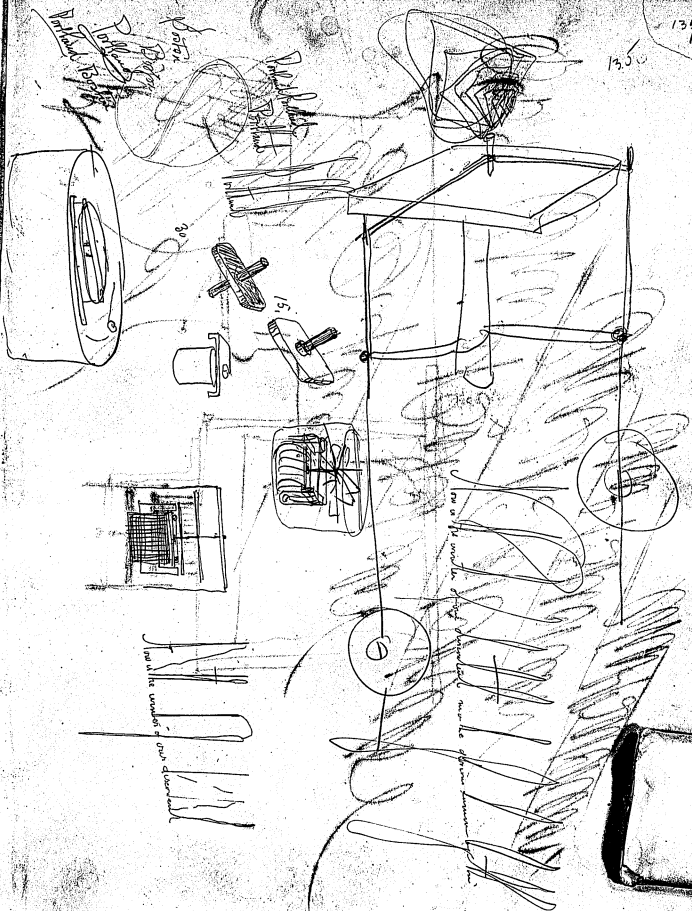


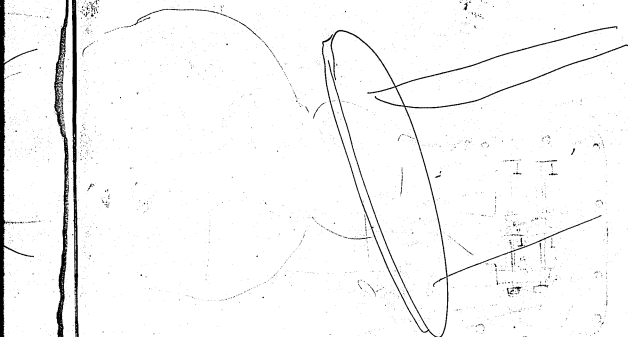
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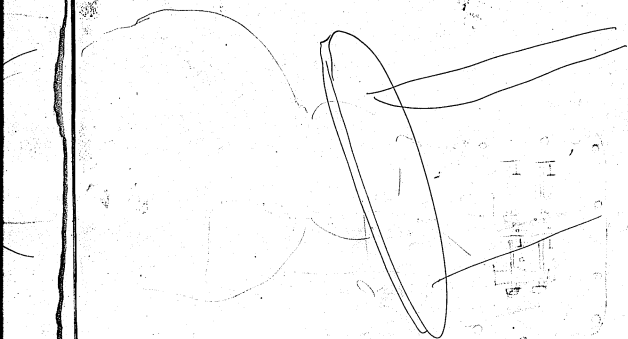


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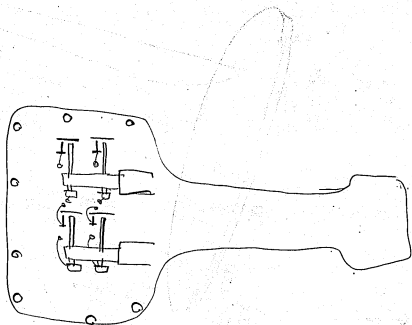
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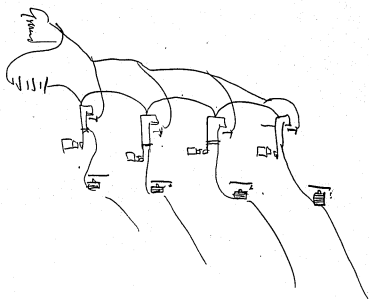




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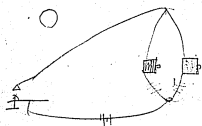
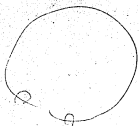
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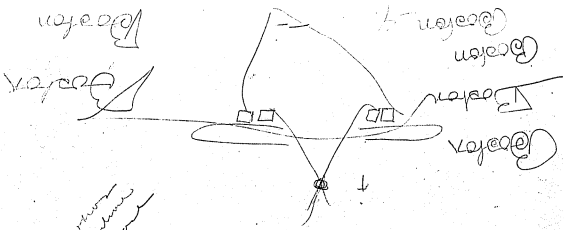
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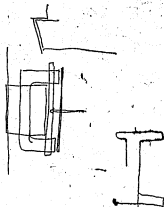
12/4



பெண் பெண்
பெண் பெண்



அவ்வாறு
வழங்குவது
அமைந்தது



$O - r_1 O - O - \dots$

Opinion - 12.11

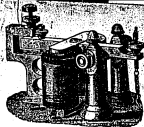
and
answer

Experiments to be tried
 Above station that don't want to be mixed up with a bunch
 Good after
 began lighting
more Ruby Battery

Good in this plan is giving the same and more

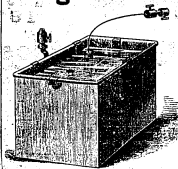
having the 2nd and 3rd

≡ ≡ ≡ ≡ ≡



Eagle's Metallic Battery.

154



No. 1



No. 2

The "Snapper" Sounder

PRICE \$2.00 per doz.
30 CENTS. \$1.50 1-4 doz.

Patented March 2, 1877.
Polished 30 c., or 6 for \$1.50, \$9.10 per doz.
Polished Nickel-Plated Box, 40c., or 6 for \$2.
Polished, with Nickel and Silver Plating, 75 cents.

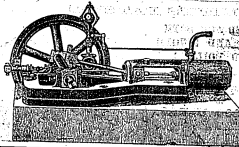
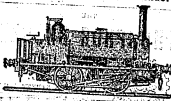
PRICE 75 CENTS.

Best quality gold on receipt of order.

R. W. POPE, Box 5278, N. Y.



TANK LOCOMOTIVE ENGINES.



This illustration shows a complex mechanical device, possibly a typewriter or a similar machine from the early 20th century. It features a large, ornate base with a curved front. On the left side, there is a vertical assembly with various knobs and levers. A large, cylindrical tank or container is positioned on the right side, connected to the main mechanism by a series of pipes and valves. The entire device is depicted in a detailed, engraved style, typical of early 20th-century technical illustrations.

LEARNERS' SOUNDERS AND KEYS ON SEPARATE BASES

These Instruments are now extensively known, and bear the reputation everywhere of being far superior in every respect to any form of Teachers' Automatic or Short Line Instrument yet offered.

No. 22 Day Street, New York

No. 38 South Fourth Street, Philadelphia



SPECIAL NOTICE

Excelsior Telegraph Apparatus

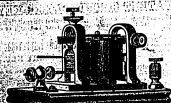
For STUDENTS and AMATEURS.

PRICES AS HERETOFORE

Instrument Complete, Key and Sounder	38 50
Instrument, with Office Outfit	7 50
Three Instruments and Outfits	14 50

J. G. TILLOTSON & CO.

DEY STREET, NEW YORK



Railroad Sounder.
This Sounder is noted for its loud, clear and firm tone, entirely free from that sharp ring peculiar to most instruments, and which eventually becomes so painful to the ear of the operator.
The B. W. have improved our Sounders by using capstern heads screw and nut, as represented in cut.
By the Dozen, \$6.50.

LOOKWOOD BATTERY

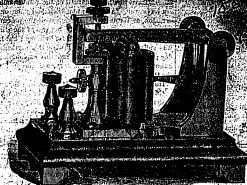
PATENTED APRIL 8, 1893,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DAY STREET, N. Y.

**EDOLANCOE
BATTERIES.**

IMPORTANT NOTICE

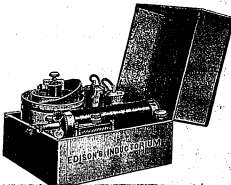
After JANUARY 1st, 1976, we will allow TWENTY CENTS for each used-up Porcupine Coll. of this hatery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A hat will be furnished on application to . . .

THE LECLANCHE BATTERY COMPANY,
No. 6 West High Street, ST. LOUIS, MO.
L. G. TILLOTSON & CO.,
312 1/2 Third Street, ST. LOUIS, MO.



WESTERN UNION SOUNDER

Some of our customers have a preference for the Western Union style of sounder, and to accommodate such, we keep these always in stock. They are carefully made and elegantly finished, and warranted perfect, as are all of our instruments. Price, \$10.



W. HOCHHAUSEN,
Manufacturer of
ELECTRICAL INSTRUMENTS

130 WILLIAM STREET (rear),
Between Fulton and John Streets, NEW YORK



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,
(Patented October 27, 1873.)

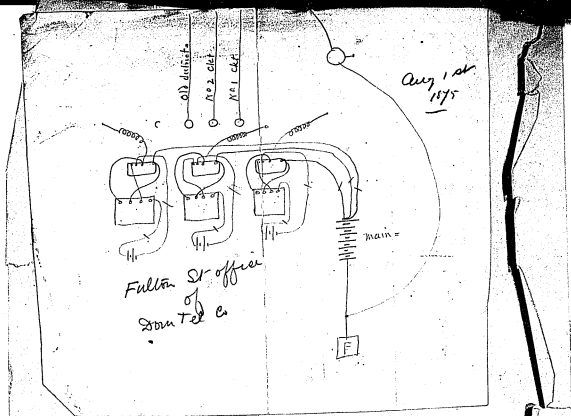


Price: \$10

Scrapbook Fragment, Cat. 30,100

This set of 12 unbound and unnumbered scrapbook pages, covering the period August-December 1873, was apparently once part of a larger scrapbook. (Some of the pages in Unbound Notebook, Vol. 9 were probably also removed from the same scrapbook.) The notes and drawings are by Edison and Charles Batchelor and relate to the electric pen, etheric force, and telegraphy. There are also clippings relating to scientific and technological matters, and an unused Domestic Telegraph Co. order form for the installation of instruments. Three loose items, which appear to have been attached at one time to scrapbook pages, have also been filmed.

THE REDUCTION RATIO FOR THIS DOCUMENT IS 15:1



Form 2.

THE DOMESTIC TELEGRAPH COMPANY,

*General Offices, 52 Broadway,
NEW YORK.*

New York, _____ 187

To THE DOMESTIC TELEGRAPH Co.

You will please place _____ of your Signal Instruments
in premises No. _____ Street, Room _____
in telegraphic communication with your Company's District Office, entitling _____ to the
Messenger, Police Patrol and Fire Alarm service of your Company upon the terms set forth
in your circular; and as a rental for each of said Signal Instruments _____ hereby agree
to pay to the Domestic Telegraph Company, One Dollar per month, and their usual charge
for service when signaled for.

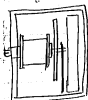
It is hereby mutually understood and agreed that this Company will in no case be
liable beyond the sum of One Hundred Dollars for any loss or damage that occurs during,
or in course of, the employment of any of its Messengers.

NO CHARGE
FOR
CONNECTING OR REMOVING
SIGNAL INSTRUMENTS.

Those desiring these instruments, please date,
sign and forward this paper to the above office.

Signed _____

Street, _____



This is a perfect guide
as the frame is put in
the way to splice the
other

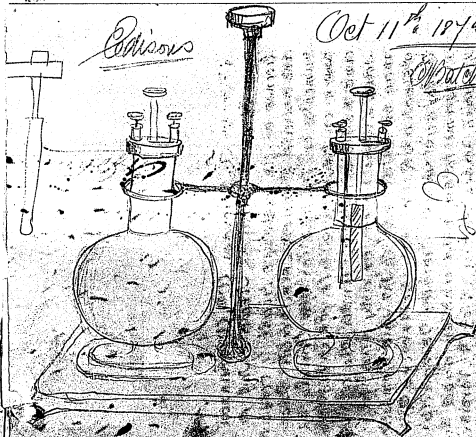
Oct 1st 1875

Cast or the cross piece put in

Edisons

Oct 11th 1875

W. S. Barstow



T. K. EDISON,

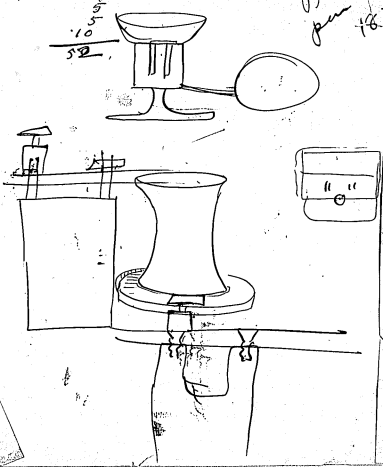
10 A 13 WAT

NEWARK, N. J.

Oct 3 1875

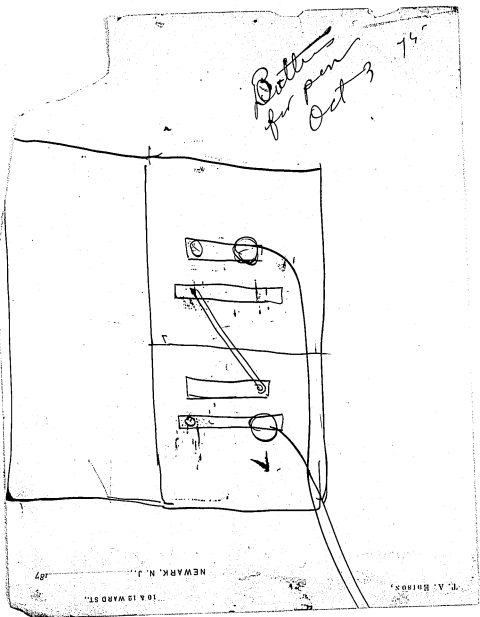
5
10
9
8
4
4
5
52

Batter
per Oct 3
1875



Boiler
for pump
Oct 3

74

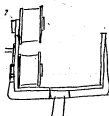


187

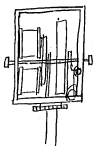
NEWARK, N. J.

10A 15 WARD ST.

T. A. BUIROS,

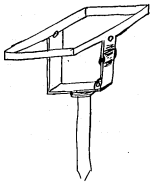


square made
of ribbed
put on these screws

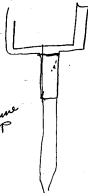


frame a then
square with over
stick where the
contact screw comes
through the open
screw

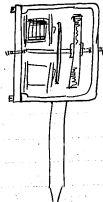
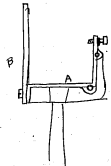
Pens.
Sep. 14 1875



Frame made like this
cast to prevent rust
being broken or bent when
dropped



A cast iron with frame
B wrought iron bolt



Cast iron frame with
wrought iron magnet
back placed on

(1) R. G. P. says: I have a small telegraph apparatus for a distance of about 100 yards, the current being obtained from a simple battery of zinc, copper and lead and white vitriol. How could I make it work on electric light? What material would be required, and how should I arrange it? A. See p. 70.

(2) W. C. says: I wish to be the strongest of the following? Three coils of Russian, zinc jacketed, carbon, carbon plates, zinc case, a twelve inch, three inch diameter, and a thick thickness; or a circuit of three coils of zinc plates for zinc, iron, and carbon plates, zinc jacketed? A. On short circuit, the zinc case is better than the circuit. On the electric light produced with one of the above batteries, A. Yes, and other. On the electric light produced with one of the above batteries, A. Yes, and other. On the electric light produced with one of the above batteries, A. Yes, and other.

(3) R. G. P.—There would be no action in a battery of zinc and copper in a zinc case.

(4) A. H. says: I have a telegraph line of 1 of a mile length, with two relays on it made of zinc and copper, each relay 1 lb. of zinc in each relay. The battery is of the Lockwood and Callum pattern, at least made in the same strong enough to produce a very disagreeable sensation on the tongue when it is placed between the wires of the zinc line. This battery will not work with sufficient force to operate the relays that are attached to the zinc line. One jar of the local battery will work the relay on a 2 foot circuit very well, but it will not work the relay on the zinc line. I can not discover any current passing. What is the matter with the relay, and what shall I do to make them work? A. Do you use ground for a return wire? If yes, try another wire in place of the ground.

(5) A. G. H. says: In *Scientific Review* for 1878, since one recommends zinc as a negative metal in primary currents, and the other recommends lead, covered with a film of what purports to be chromium, and the other recommends silver, if chromium can be so deposited, what metal of the metal alloys that can be used? A. The chromium is not a metal, but a compound, and has electrically, but is preferred mechanically, and then proceed into the zinc.

(6) G. H. says: Can a lightning and zinc wire be used as a conductor, after standing for 8 years and becoming considerably corroded from exposure? Is it more dangerous to use such a wire than one of zinc? Two years ago, because our factory was recently struck by lightning, the electricity having hit the rod after passing down a short distance and entering the building, where it expended its force among a lot of iron conductors, which lay upon the floor directly opposite that part of the wall to which the rod is attached. Its action upon these conductors has shown its violence, where the brass ones to be seen as if they were melted, though the roughness of surface is more and brighter and looks as if small quantity of zinc on it had been dropped there. I cannot find that the fact of the use of the rod and the zinc wire, and therefore wonder why the electricity should leave it, unless its conducting qualities are impaired. Would repainting the rod restore its efficiency? A. The use of the rod and the zinc wire is not a good one, unless the zinc is not used, but its conducting power, or the rod is distributed in lot by rod. We would be glad to have you examine the portion which goes into the earth, and let us know whether it is sufficient, how deep it goes into the ground, and what the condition of the earth about it. It is in the ground, and whether the rod contains any joints, or whether it is one continuous rod. What metal is the rod composed of?

(7) G. H. asks: Of what shape must I construct a magnet to enter or pass the most power? A. Of horseshoe shape. S. This is powerful to get per square inch of S. What is proper to the size and number of turns of the wire and the strength of the battery. S. What rate does the power diminish as the distance is increased? A. As the square of the distance.

(8) J. M. says: I refer to make ground connection by taking two plates of zinc, the larger square, 1 selected copper wire to them and buried in moist earth about 2 feet in ground, and I would not work with about the same power. What is the reason? A. Your plate was too small. S. I would a battery in the following manner: I want a jar with coil of copper in bottom, and a zinc sitting in the jar with both to connect and suspended about the copper, with wire attached. A wooden cap was put in the jar with in the bottom for the zinc wire. I put it about about 1/2 inch, and it is given a current. Is such a battery better, and what do you think of it? A. Your battery is a modification of the Daniell. We cannot see that it has any peculiar merit. A. In off electric light, please? A. See p. 70, yet.

(113) H. T. asks: Is there anything gained in a Callum or gravity battery by covering the zinc with united paper? Does it reduce the working strength of the battery? In case of an accidental disturbance and mixing of the solutions, does it prevent the escape of copper upon the zinc? I find after using that the paper is covered here and there with crystals of copper; but upon removing the paper I cannot see any traces of copper upon the zinc. A. If the gravity battery is properly put together, so that the fluids do not mix, there will be no loss of zinc. The paper will do no harm and will keep good.

The Heliograph of Mr. Munce.

By C. BECKER.

Through the general introduction of Electric Telegraphy, and the last several operations of the Morse alphabet, it seems to us, to Mr. Munce, who has the advantage of a thorough knowledge of both, and the privilege, if it can be called one, of a long residence in a country with plenty of sun, to develop our mind to improve the existing apparatus into a system. His aim has been to produce an instrument which is very compact, very portable, easily set up, and easily worked. Although he was used in favor of larger instruments (which are still preferable for permanent stations), he is now convinced that no instrument of the size here shown is all that is requisite. The chief objection to the adoption of the semi-heliograph is, that we cannot command the sun to show in the same manner that we can control a galvanic battery; and it must be understood that Mr. Munce's system is only as an auxiliary to other systems of light telegraphy. It would come into operation at distances when other methods are useless or tediously slow, and it compares favorably with existing systems of signaling in cheapness, range, the simplicity of construction, and, last, in portability. The flashes are less liable to any one placed far to the right or left of the direct line, so that, from elevated points, far distant communications could be kept up with a facility without the tediousness having any suspicion of the fact.

It would be superfluous to give instructions, when within the last few years the use of these instruments might have brought about the most important results.

The instrument consists of a light, but firm, trigonometrical, similar to those used for prismatic compasses. On the top a plate is moved by a tangent screw which admits of quick and slow motion, and the plate carries on a pin a semi-circular ring, which again carries on pivots the round mirror, the reflecting of which is removed in the center for the space of a circle or not 30-60 inch diameter. To the plate is also attached a simple key, which is pressed down and springs back like an ordinary Morse key. This key is connected with the top rim of the mirror by a steel rod, which can be lengthened or shortened—as occasion may require.

may easily require by turning the handle and carrying the rod through the small brass ball which secures it to the edge of the mirror.

By means of the instrument adjustment, and the tangent screw the glass can be altered, as the ever-changing position of the sun may require.

From 10 to 15 yards in front of the instrument is placed a eight-inch glass. This rod is to mark a spot exactly in a line with the center of the heliograph and the distant station. A steel nail marks the spot, and a wooden cross-piece marks where the flash plate when not directed on the opposite station.

The instrument can be set up nearly for working in a few minutes. When the exact position of the distant station is not known, a flash of sunlight must be thrown in the direction of the most likely point, and this must be continued till it is answered by a flash, which indicates that a distant signaling party is on the look-out. Then, after pointing the tangent screw, the glass must be turned to a convenient angle, and the sightglass must be directed in a line with the distant station by looking through the small aperture in the center of the mirror. When this is effected, the stud must be raised or lowered till it is in the line of vision on a level with the center of the glass and the distant flash, and the stud cross-piece must be placed at right angles to the upright, about a foot below the stud. After being thus adjusted, the instrument must not be moved.

The spot will be observed gradually to rise or fall, according to the direction in which the sun is apparently moving. The handle of the key, or the tangent screw, or the glass, in any case, may be turned slightly after every two or three words, to insure, as far as possible, that the center of the spot shall be in the spot when the key is pressed down.

When the sun is rather low in the horizon, and behind the signal, it becomes more difficult to direct the flash with accuracy. In consequence of the obtuseness of the angle the spot loses its clear face, and becomes rather dim when reflected on the stick. If it is required to work frequently when the sun is in this position, the employment of a second glass on a light tripod stand is recommended.

Just it would be useless here to enter more into the details of working the instrument: suffice it to say that, in experienced hands, twelve words and more per minute have been obtained, while others claim that men—after a fortnight's practice—could obtain only from four to five words per minute. As to the distances, 10 and 25 miles—more is very difficult, but 10 miles—have been obtained.

A number of officers of the Italian Army have tried and reported upon the instrument, and with the exception of one or two, most favorably of the system as an auxiliary to existing systems, and efforts are being made of the present moment to insure their adoption for the Italian Service by the Government.

THE MATHREPHOT OF FREDERICK.

(112.) In letter 100 "Enquirer" says: "What observation go to show? It is not that the interior of the earth is solid."

I answer: That theory has long been discredited. For two centuries it has been a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error.

It is a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error.

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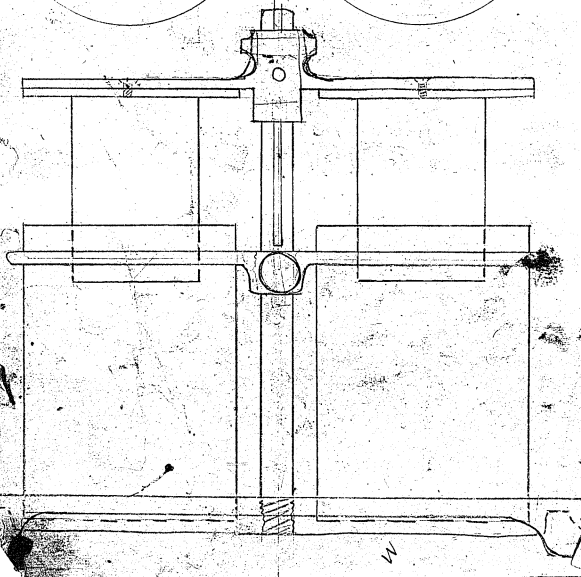
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It is a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error. The theory of the earth's interior is a subject of dispute, and each one may be in error.

Edison's Autographic
Pen Battery

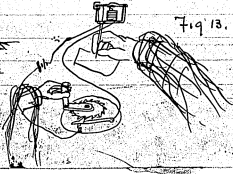
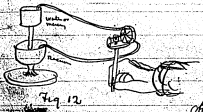
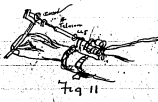
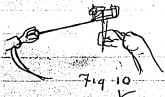
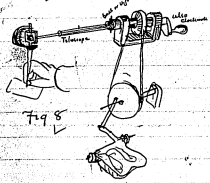
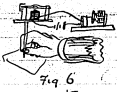
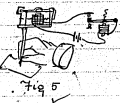
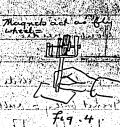
Designed Oct 14 1875
Batchelor



Dec 17, 1895

For Mr. J. B. ...

Thomas A. Edison.



Double needle punch end end of needle a double l. v. also

as hook = write on leather, wood, blotting paper - cloth

* Right battery = rubber in top, left battery = using common needle

pen through eye

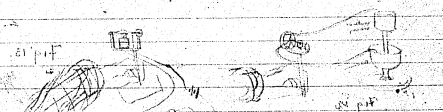
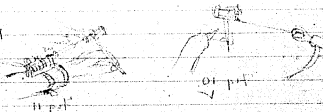
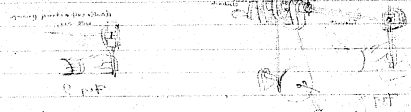




Fig 14

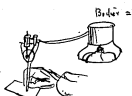


Fig 15



Fig 16

Ink roller - Cloth disk; wound yarn. felt Roller covered with cloth a
Printer roller; do covered with cloth, compressed sponge, soft leather
Roller sponge =



Fig 17

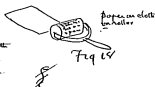


Fig 18



Fig 19

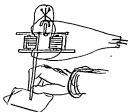


Fig 20

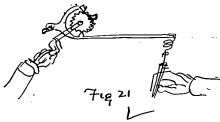


Fig 21

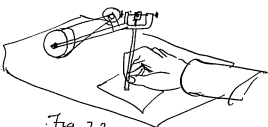


Fig 22

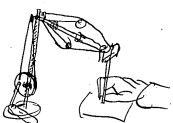
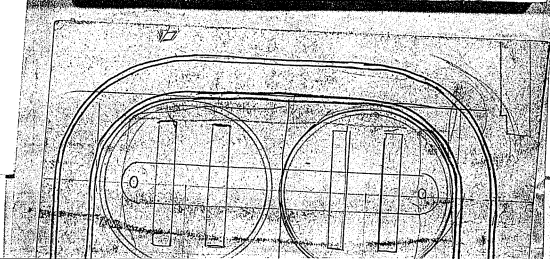
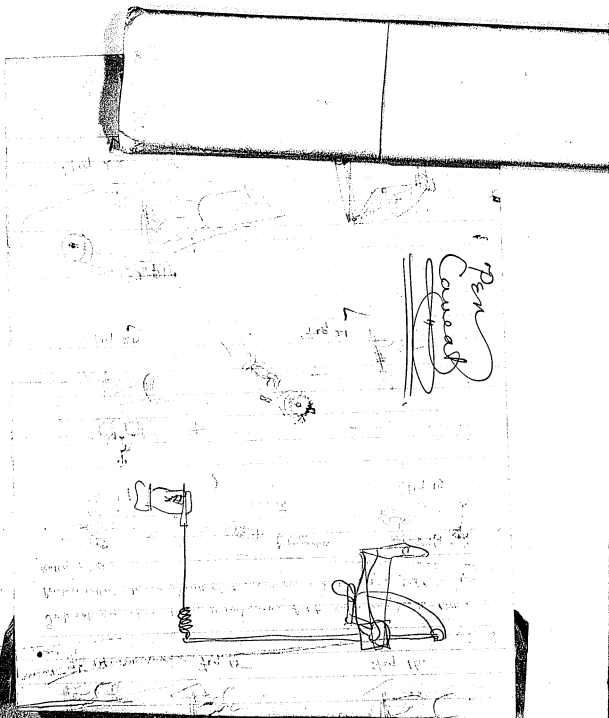
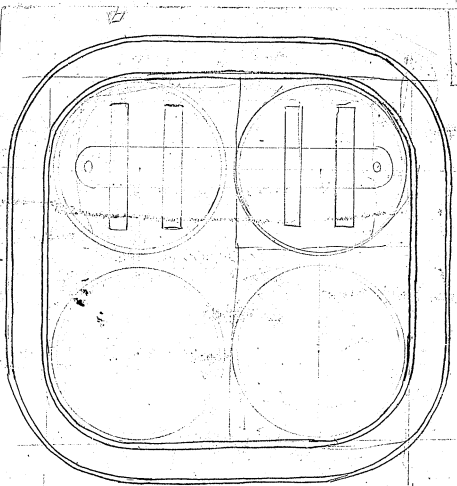
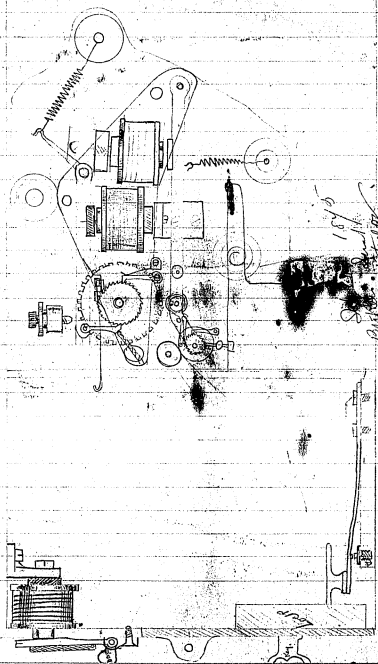


Fig 23





Oct 11 1895
Batchelor



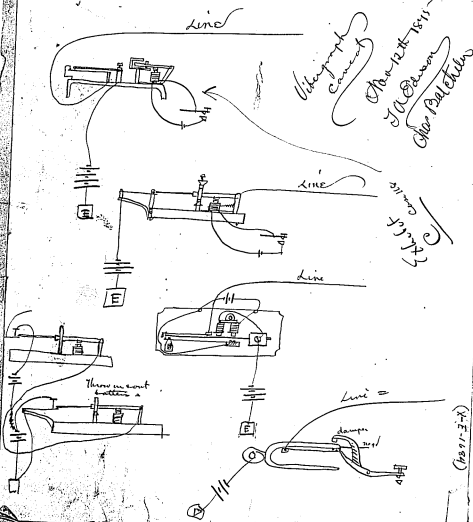
A. EDISON,

(of course, etc.)

10 & 13 WARD ST.,

NEWARK, N. J.,

187

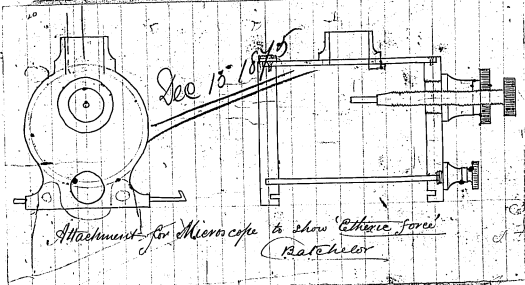
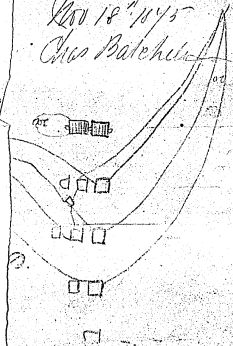


Nov 24

W. H. H. H. H. H.
Sparks A.

perfect on 1 1/2 Cells looking at
Bradley No. 4. and 45.
Works little and slow on 2
old 1 1/2 cells with shalopani
on the turn from yellow to brown
or green ^{looking 40.} it comes out be
only feeding. - on new battery
looking 59. goes far and
fast in the same way
with large sun caps =

Nov 18 1895
Chas Batchelor



See 15. 1895

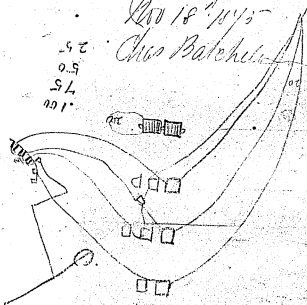
Attachment for Microscope to show 'Ethereal force'

Batchelor

(X-F-1684)

Apr 18th 1945
Chas Batchelor

1.00
75
50
25



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Dropers
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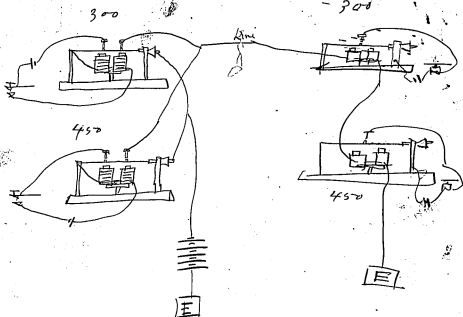
Don't know
how to

T. A. Edison,

10 & 12 WARD ST.,

NEWARK, N. J.

487



Laboratory Scrapbook, Cat. 1146

This scrapbook covers the period October 1877-December 1880. The notes and drawings are by Edison, Charles Batchelor, John Kruesi, and Samuel D. Mott. All relate to electric lighting, except for a note on the telephone, dated July, 1878, and a drawing of ore milling apparatus, dated April 20, 1880. Many of the drawings and notes were prepared for caveats or patent applications. On the back of some of the notes and drawings there is a page/volume number, indicating that they were removed from the sequence of numbered pages in Unbound Notebook, Vol. 16. Some of the material in this book has also been copied into Experimental Researches, Vol. 1. The book contains approximately 140 unnumbered pages.

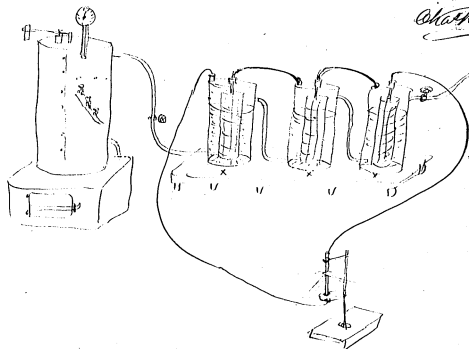
Oct-1872

Dynamo Galvanic Apparatus.

Oct 26 1877

J.R. Edm.

Chas. Katchelor



X X X are cast iron boilers with a cylindrical rack in middle filled with pea size granulated carbon the iron cylinder is about 7 feet high 3 feet diameter they are connected together in usual way for batteries, they are filled $\frac{2}{3}$ full salt water or water containing any other conductive conductor such as SO_2 leading from a zinc boiler one from which flows ^{the} through the hydrogen and agents it keeping it deposited. Our experiment tonight was successful with the in a small way - galvanization was stopped entirely and constant deflation was had running from 10 on 9 without stop to 50 with stop & regulation of water

T. A. EDISON,

Menlo Park, N. J.,

1880.

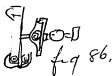


fig 86.
Caveat 76

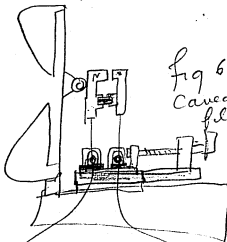


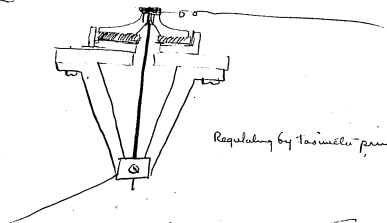
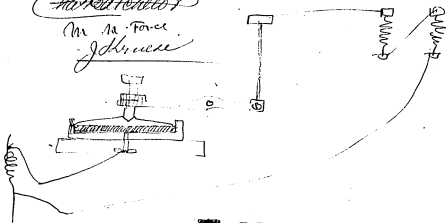
fig 62 -
Caveat 76
filed Dec. 18/80



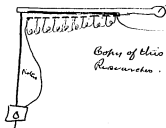
fig 83. Caveat 76

4
Electric Light April 14 1878

Thos A Edison
~~Mr. A. S. Folger~~
 Mr. A. S. Folger
 J. H. Mearns



Regulating by Tasmelli principle



Copies of this on page 16 Vol. 1. Experimental
 Researches. Sept 28. 1878

Wm. L. Lamm

— July 1878 —

T. A. EDISON.

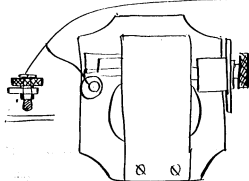
Telephone

T. A. Edison 187
Menlo Park, N. J.

Kruesi.

John Kruesi
July 1878 Force

This must have a cam
and thumb nut to lift out the
worm so as to put in fresh pieces
It can screw on with shoulder screw

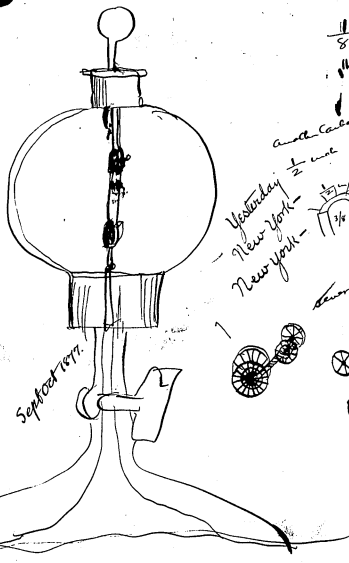


Batchelor



Aug 1876

78=



September 1877

1 Carbon

Paper
Carbon
 $\frac{1}{8}$ wide - $\frac{3}{4}$ wide
blatting

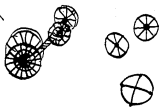
and Carbon -

Yesterday
New York -
New York -



for $\frac{1}{2}$ to $\frac{1}{2}$
under

blatting
Several thickness of white

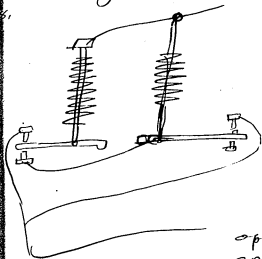


Box

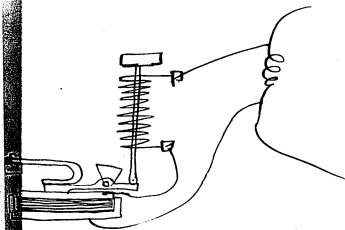


Sept 8 1878

Thomas A. Edison
Electric Lamp



It may be possible that
one regulator at the Central
Station may be made to
do it for all the main
current being regulated
by the heat of a large
spiral so that as the
current strength rises to
a point approaching the
melting point of all the
spirals that it will be
opened by the effect of the
spiral at the Central
Station.

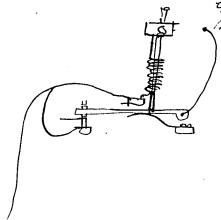


Carbon discs
or other finely divided metal,

Sept 9 1898 *Edison*
Chas. Batchelor
Electric Light
U.S.

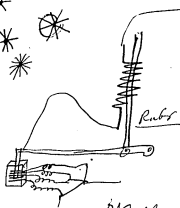
Smith & Spence

Ed. Carman
M. N. Ford
J. H. Russell



... ..

*
*
*



Wallace.
 500
 Million 1000 500
 Wallace 25, 100, Portland Wallace
 Wallace Boston New Wallace

Wallace
Wallace
Wallace
Wallace
Wallace
Wallace

Copied on page 181. Vol. 1.
Ed. & R. ... Oct 7, 1898

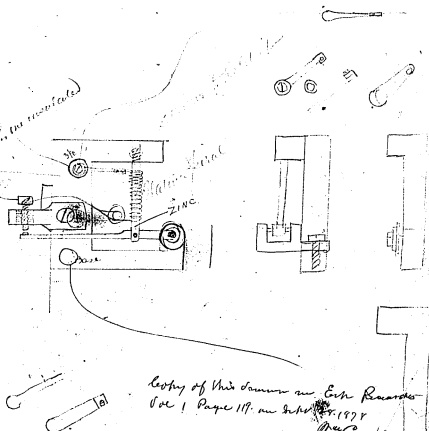
Wallace 127

Electric Light

Sept 10. 1878

Edison & Co.
Chas. F. Smith

Edison
Smith
in force



12

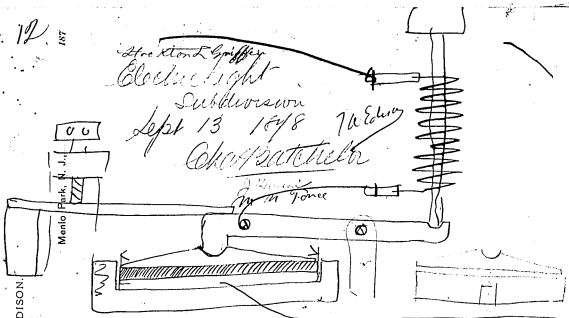
INT

Houston Griffith
Electric Light

Subdivision

Sept 13 1878 T.A. Edison

Chas. Batchelder



T. A. EDISON

Revised this on page 121. Exp. Records Vol 1
3rd run of oct 1878 Wm. Lammiman

00

Electric Light Subdivision

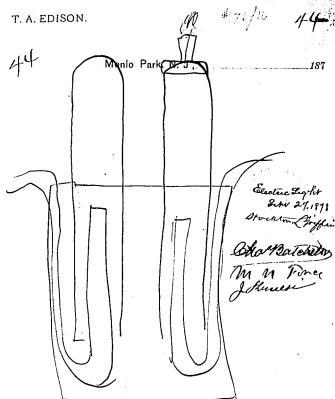
Sept 23rd 1878
 31

T. A. EDISON.

44

Menlo Park N. J.

187

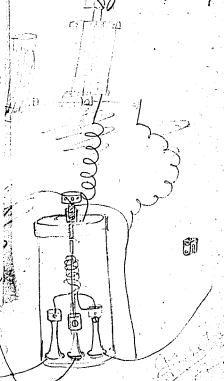


Electric Light
 Nov 27, 1878
 American Electric

Edison Patent
 M. N. Force
 Johnson

Copied from page 104 Vol. 1. 5th Rev.
 Dec 2, 1878 M. N. Force

Class Patent
 M. N. Force
 that no end
 means of bulging

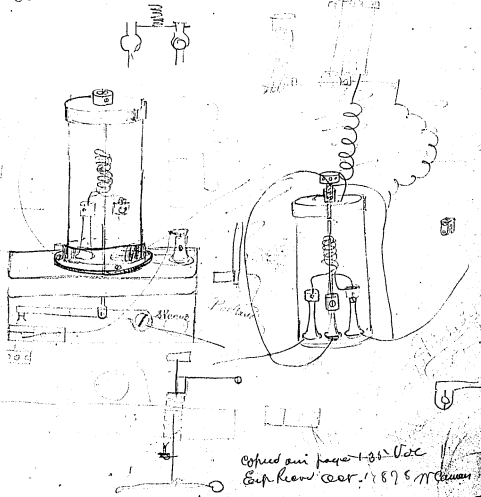


Copied from page 104 Vol. 1
 Exp Rev Dec 1, 1878 M. N. Force

91
92

Sept 23 1898
J. H. P. 31
Chas. K. Atwater
J. H. P.
Am. N. Force

Double coil fastened both at one end
expands lengthwise instead of bulging
out

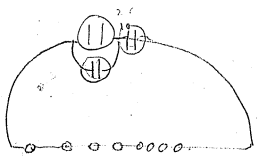
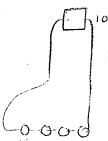


Copied and paper 135-136
Exp. Keen Oct. 1898 M. C. C.



708

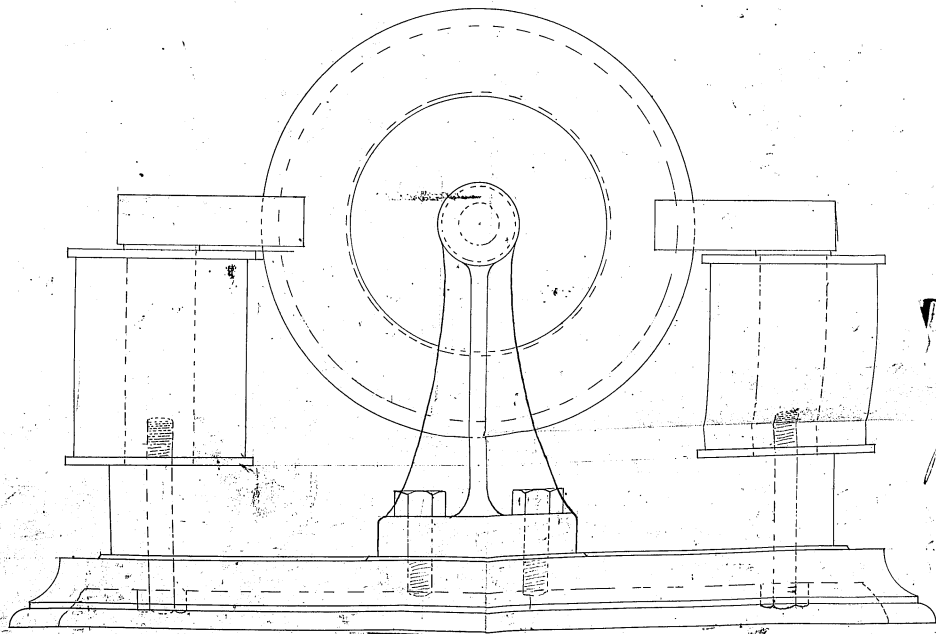
3rd & 5th Cavalry
11th Cavalry
M M Force
J. M. M.
Chaparral
Oct 26 1878



5

10

Edisons Dynamometer
No. 11

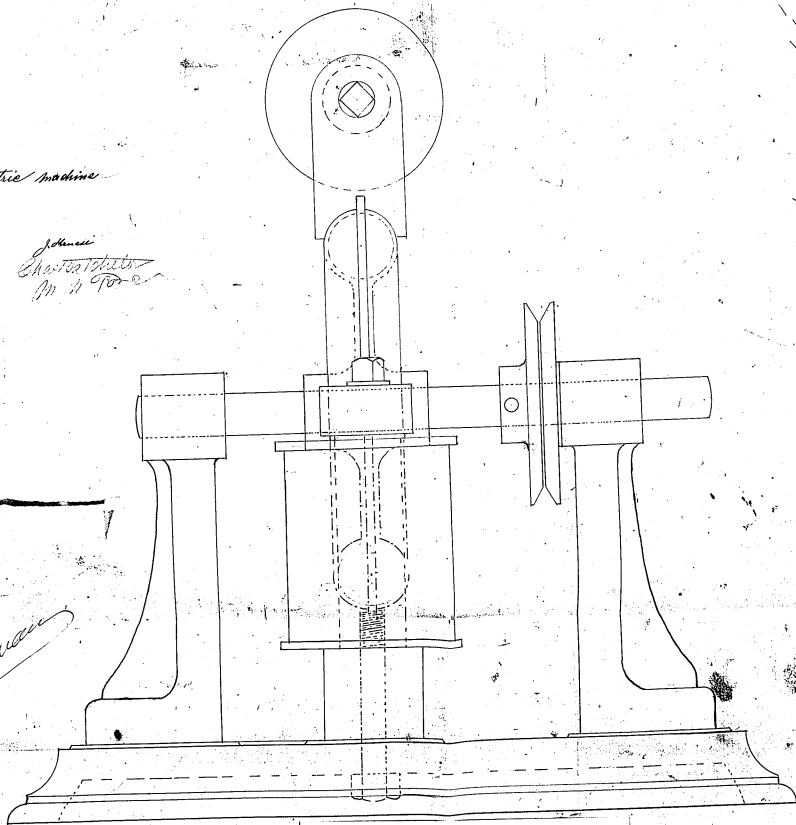


[CONTINUED ON THE NEXT FRAME]

Edison's Dynamo electric machine
Nov. 11th 1888

Johnston
Charles Johnston
M. H. P. C.

Edison
M. H. P. C.

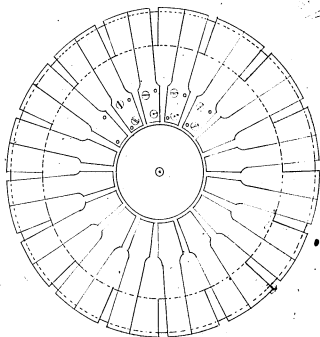


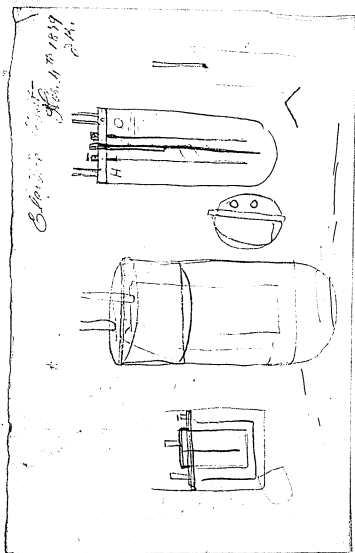
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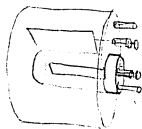
— January 1879 —

Only 12 springs
out 16 —
Bald

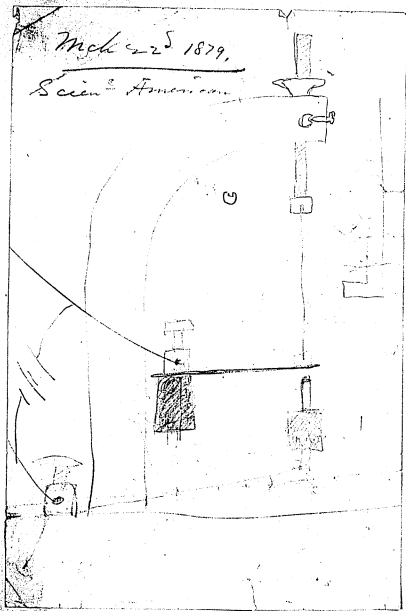
Calvin Maggett Smith's death
January 1879
January



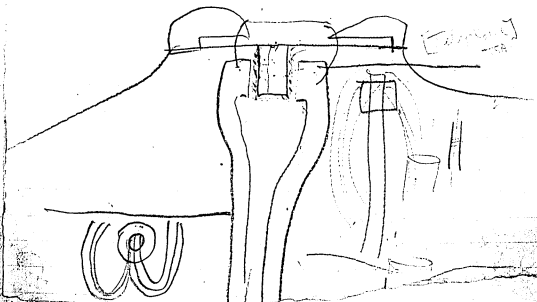
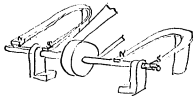
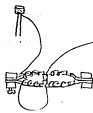




369
—
16



addition to Great gun
Dunk. March 28 1899



1 copy of
the printed

B.L. Abbott
J.B. May 9th 1871

387

16

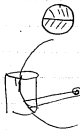
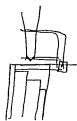
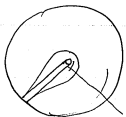
C. Nistrom
1897



388
16

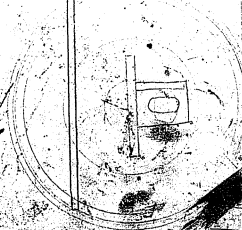
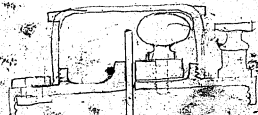
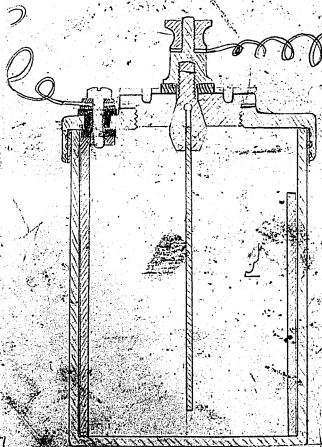
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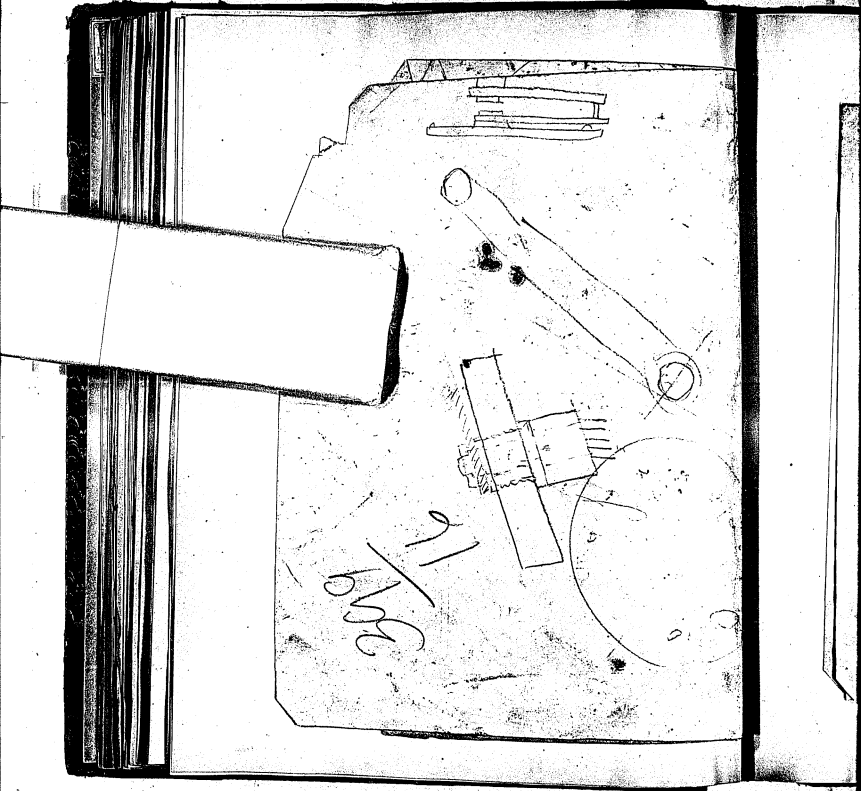
gripper for E.L.
July 31 1899



Disposing cell for Edison Electric Light System
New York

J. P. Kinsley





Menlo Park, N. J.

Dec 19 1894

English

~~Professor~~ Protection

wanted to find Mr. Conant

In my system of Electric
Lighting. I have ^{now} proposed to
in a previous patent to
Regulate the pressure or
Electromotive force at the
Central station by varying
the strength of the field
magnets around the
induction bobbin connected
to the main conductors
in ^{rise or fall} ~~any drop~~ in the Electromotive force
due to putting on or off
lamps being indicated
by an electrometer; I find
that an Electrodynamometer
similar to that of Webber
but of high resistance.

2

is ~~preferred~~ an improvement
upon the electric system
owing to its greater
reliability.
The ^{function of the central station is to} ~~city~~ system A City
is divided up into districts
in each district there is a
Central station, which
station is provided with
sufficient ~~real~~ power
+ ~~transmits~~ ~~transmits~~ ~~transmits~~
Electric generators to
supply half a mile
radius, at this station
I employ say five engines
Each of 250 horse power.
Each engine runs by a belt
a separate line of shafting
on this shafting is belt.

3

Say 40 electric generators,
so that each engine sets
system of generators may be
considered complete within
itself = 2 large rods of
Copper are conveyed in
proximity to all the generators
and connecting lines are
arranged so that any
generator may be placed
across & fed into the
two main conductors, all
the generators when connected
to the mains are connected
in Multiple arc, and the
field of magnet of every
generator is so wound
the size of the pulley upon
shaft made such a disc
that either by increase

or decrease $\propto \frac{1}{r^2}$ $\propto \frac{1}{r^2}$
or by a weakening or strengthening
of the field magnet. The
electromotive force of the
induction coil can be
adjusted to have
exactly the same
electromotive force as
all the other machines.
I employ several subsidiary
Electric Generators, belted
on the shaft of the first
engine which is ^{used} all in use
and the current from these
machines is conveyed by
leading wire to the field
magnets of all the
generators & serve to keep
a constant field.

A second series of these
subsidiary machines
is connected to the
shaft of the ^{main} Engine,
and connected in duplicate
to be used in case of
emergency ^{or in case of} ~~should~~ ^{when}
"first engine stops" ~~for~~.

— A switch serving
to change one subsidiary
generator from one set to
another set, so the
change can be made
gradually. The subsidiary
generators are also
arranged in multiple
wiring, but the field magnets
of main line generators
are so connected that
there will be a row of

6

Day 10 magnets connected
in series and these
sets connected in multiple
etc. Switches are provided
whereby Day 10 field
magnets are disconnected
at will the induction holding
having previously been
disconnected from the
main,
for energizing the field
magnets of the subsidiary
generators I use a
Dynamo Electric machine
the current from which
passes through the field
magnets of all the
subsidiary generators
either in series or in

Multiple arc in this
Circuit I place a large
number of resistance
coils of large wire and
subdivided so that
each has say $\frac{1}{50}$ of an
ohm a wire between
each resistance coil leads
to a ^{rotary} commutator which
in turning short circuits
the greater or less
number of Resistance
Coils, thus increasing or
decreasing the strength
of the current in the
field magnets of the
or battery generator.
This in its turn increases
~~the~~ or decreases the
strength of the current

Menlo Park, N. J.,

18

8
in the induction coil
between them, and this
current in its turn
increases & decreases the
strength of the field
magnetic of the main
line generator & so
a rise or fall in the
pressure or electromotive force
of the current according
as more ^{or less} energy is
drawn from the ~~generator~~
station by pulling on
or off lamps ^{or electric} of ~~magnets~~
engines.
Thus I am enabled to
cause a rise or fall in the
pressure or electromotive force
by turning of the commutator
handle, to indicate the

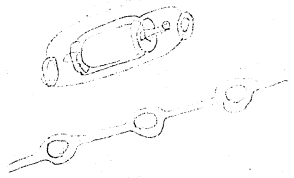
rise & fall of Electromotive
the Operator at the Commutator
has before him the ~~Electromotive~~
^{as well as} several standard
Lamps to indicate the rise
& fall.

This apparatus I propose to
place in a room disconnected
from the main Rooms containing
the Generators & Engines, all
connection there will be made
by wires. But the
movements of the Commutator
is transferred by gearing
& shafts to a large
dial place ^{and} ~~in~~ the
~~the~~ generator room &
one in the Engine room
so that the Station
neither way know

10

the proper time to start
up or stop down one or
more of the turbines.
It will probably happen
in practice that from the
breaking of belts or wires,
other causes that ~~are~~ a
generator will cease to
be electrically to the
main although the
induction coils be intact
this will cause the
current from all other
generators to cause this
generator to reverse its
rotation & perhaps burn
the wire, to prevent this
& insulate a short
wire in the induction coils
circuit made of Bismuth

The generator is mounted on a base which is bolted to the floor of the engine room. The generator is connected to the battery by a cable which runs through a conduit. The generator is also connected to the battery by a cable which runs through a conduit. The generator is also connected to the battery by a cable which runs through a conduit.



will meet the
 one of the generator
 but too great a heat
 is reached.

Between
 Each generator is placed
 with a loose pulley on
 a stand upon an upright
 upon which the belt may
 be moved in case a
 generator is to be repaired
 when the battery of generator
 of which it is one is
 in use.

It is well known that
 All different parts of the
 main circuit outside of
 the ~~generator~~ ^{generator} station
~~power~~ Electric Engines
 almost similar to the

(10)

Menlo Park, N. J., 18

fusible metal which
will melt & save the
wires of the generator
but too great a heat
is reached,

Between
Each generator I place
with a loose pulley on
a shaft upon an upright
upon which the belt may
be moved in case a
generator is to be repaired
when the battery of generators
of which it is one is
in use.

It is well known that
At different parts of the
main circuit outside of
the ^{generator} ~~central station~~
place Electric Engines
almost similar to the

(12)

may be placed
generators for the purpose
of ~~transferring~~ giving
out power to the rest of the system.
I find that Engines giving
varying amounts of power
from 20 horse to 200 of a
high horse may all be
worked in multiple arc.
The less the power requires
the smaller the number of
the greater ~~must~~ length of a
finer wire used ^{than} that for
a larger power; & I find
that it is proper to
place the ~~major portion~~ ^{greater length}
of the wire & resistance
upon the field magnets.
In using these small machines
in multiple arc for running

13

a Sewing machine I arrange
a ~~switch~~ for disconnecting
the machine from the
circuit, a belt to
connect the motor with the
sewing machine, using
a very small pulley on
the motor & a large pulley
on the Sewing machine
so as to allow of high
speeds in the motor,
I regulate the speed of
sewing by a friction
lever pressing on the
driving pulley of the
sewing machine which
lever may be being
connected to the foot
rest may be pressed
lightly or heavily on the

14

pulling of the rearing
machine & thus
or diminish its speed unless
or stop it all together,
the pulley of the motor
being a friction pulley
allows the motor shaft
to revolve at a slower
speed even when the
belt is stopped.
When the motor is
arranged to pump water
to a tank I use a float
valve when the water
becomes too low closes
a circuit & connects
the motor to the
main line, and when
the water is sufficient
in the float returns

15

15th to disconnect the
motor from the circuit
~~then~~ for running machine
shaped with these motor
& where an even speed
is required. I arrange
upon the shaft of the
motor a governor with
works in the ordinary
~~usual~~ manner out
which when the speed
has reached a certain
point causes a lever
to open the circuit
& disconnect the
motor from the circuit.
~~This prevents~~

these motors work
on the same main

Menlo Park, N. J.,

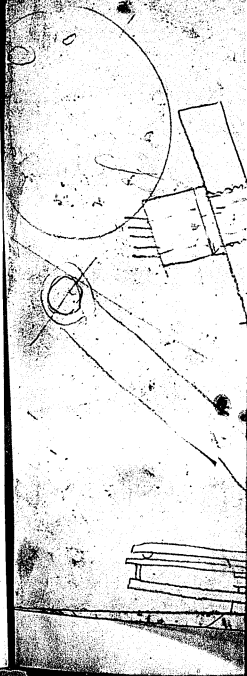
16

Conductor as the
lamps.

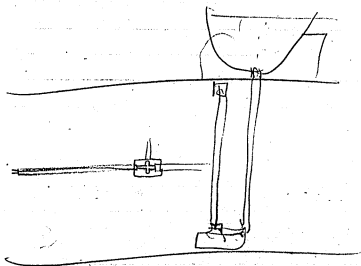
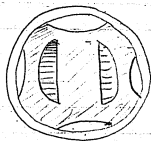
CHART

Dec 16

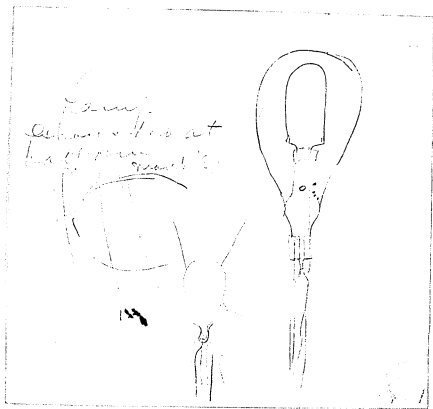
Recorded in Book 5 pg 127

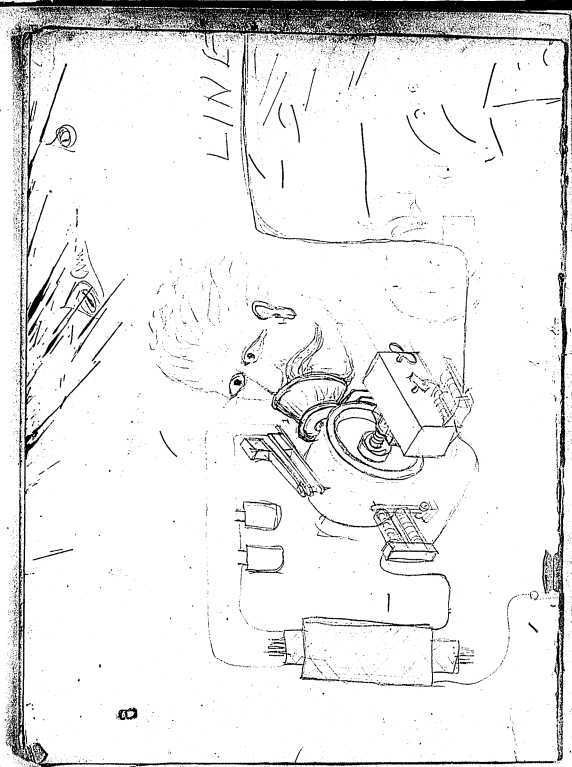


Feb 7 1880



— March 1880 —



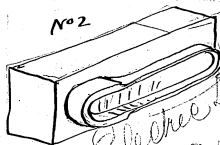


On Milling

or Shovel to Port
blower

Track of RR. with rollers movable,
magnetic traction.

No 2



Electric Light
Machine also.

Calling down wires & preparing
pt. leaving them standing -



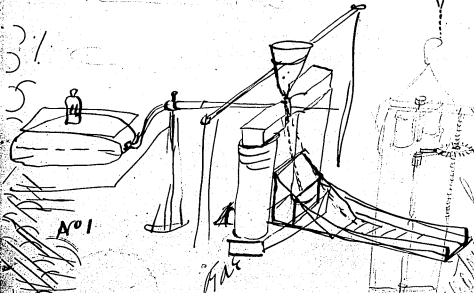
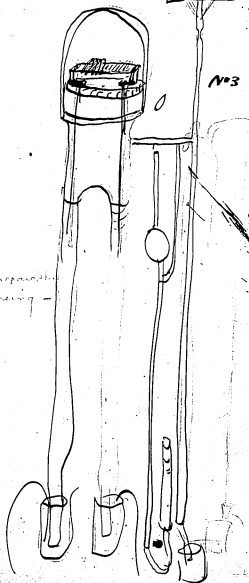
170 2

4

Electric Light

Getting air out of box

No 3



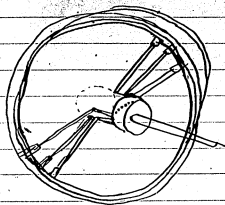
No 1

Flare

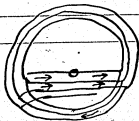
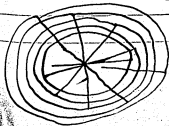
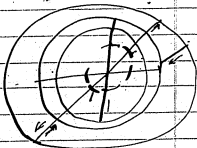
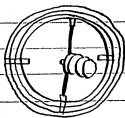
April 20. 1850

G. P. Mearns

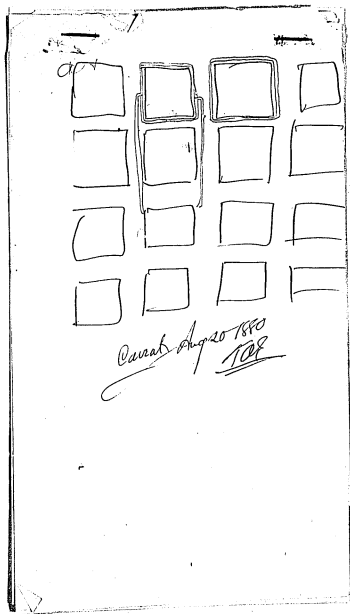
Albany N.Y.

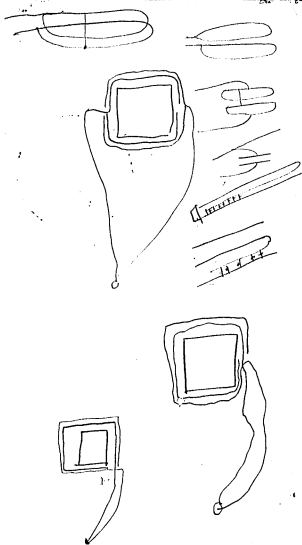


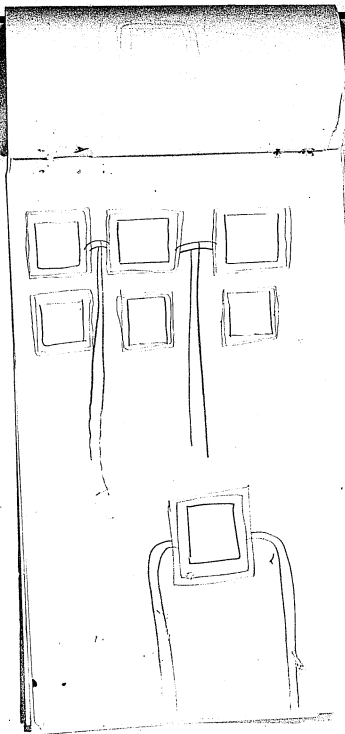
May 16 1961
JUL 5

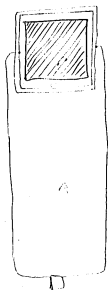


August 1880



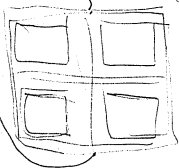
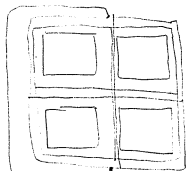


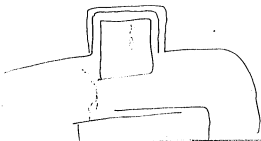
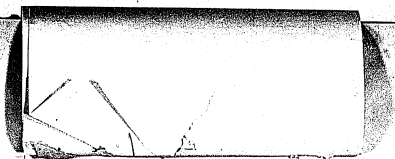


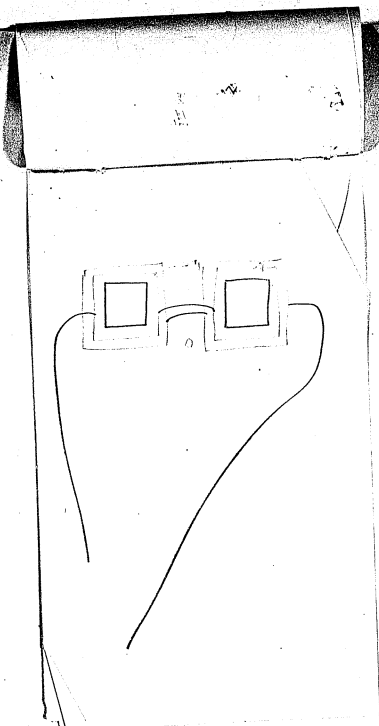


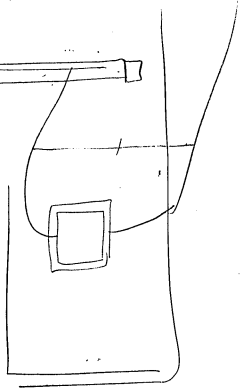
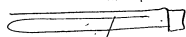
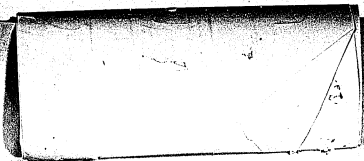
patent

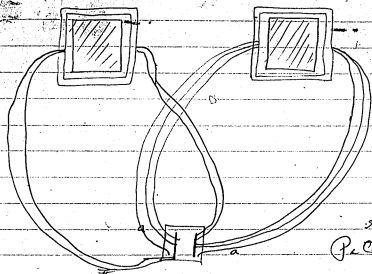
Patent





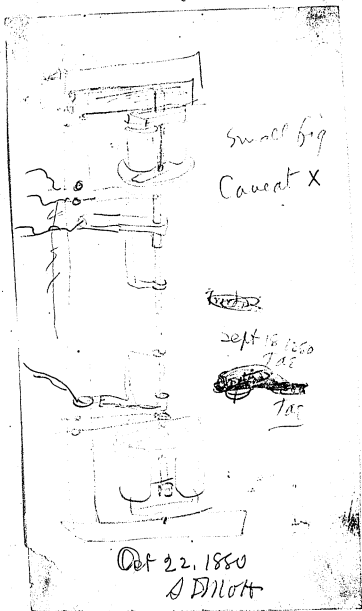






Aug 24 1880
P. C. C.

~~One~~ One block using more than other block or rather a section of block using regularly a larger no of lamps than another section, I prevent drop on the heavy block by adding an extra section of Cords a when framing the EMF which would tend to raise the lights in the poor blocks abnormally. —



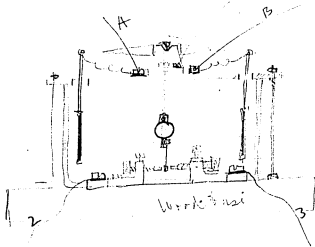
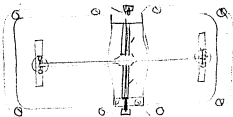
T. A. EDISON.

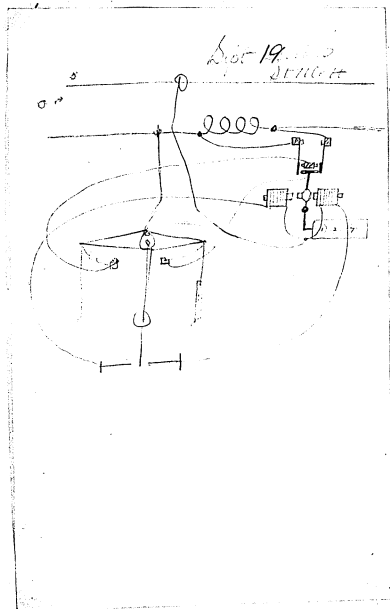
Menlo Park, N. J.,

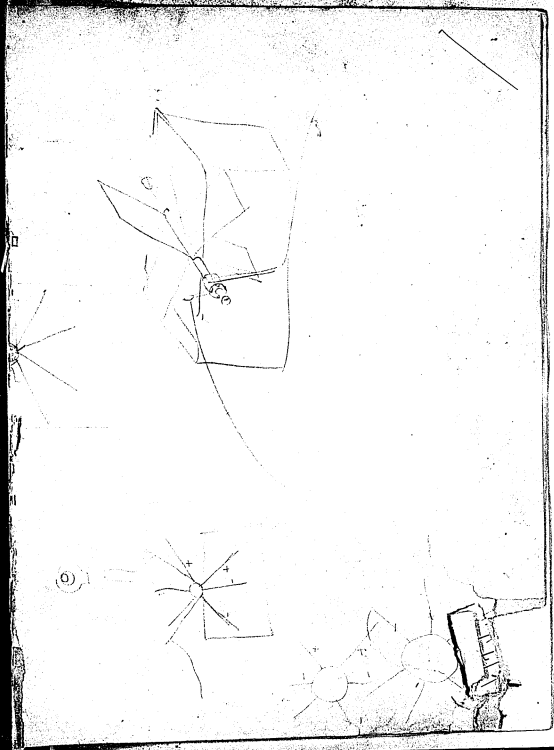
1880.

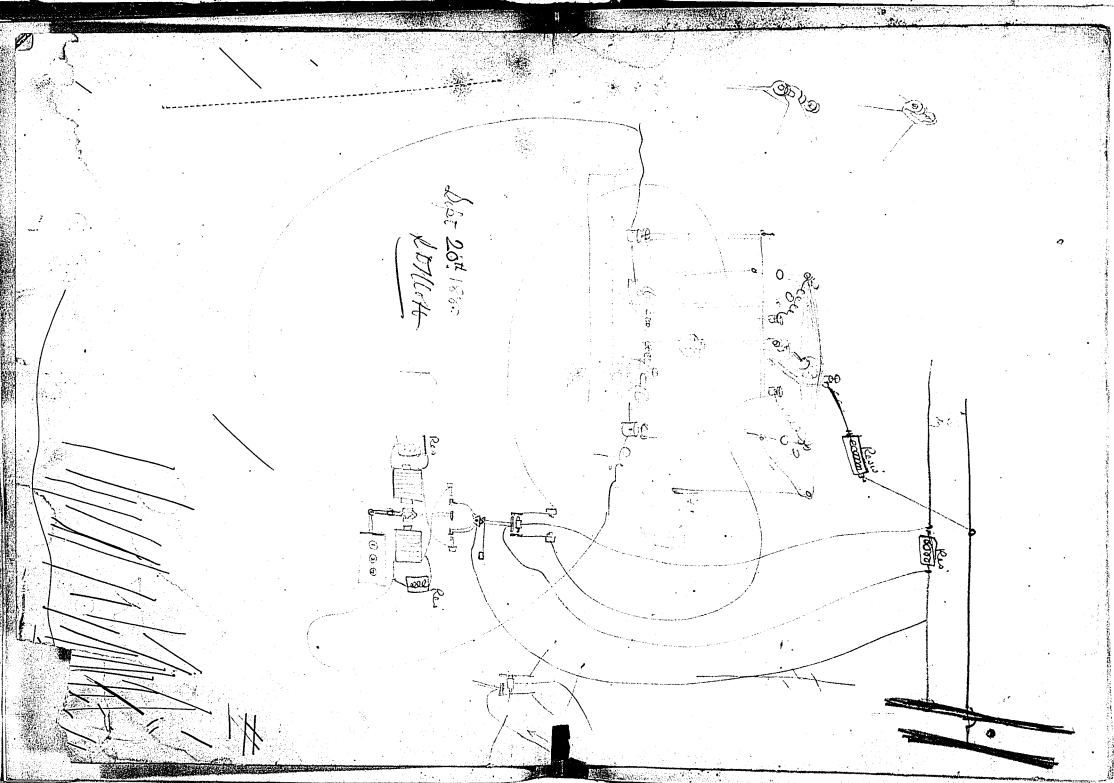
U. S.

Sept 19th 1880
Still in

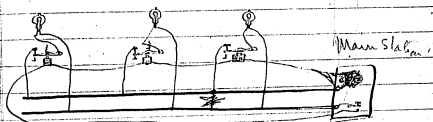








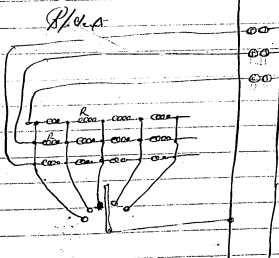
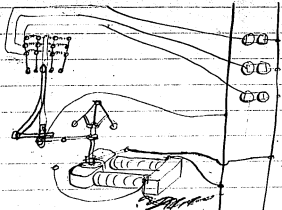
Sketch



Patent

Sept 21st 1880

W. H. C.

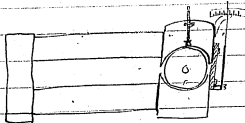


Patent

Sept 21. 1860
J. M. L.

September—
1880—

Sept 21 1880
J. H. Mott



Patent

T. A. EDISON.

Menlo Park, N. J.,

1880.

Get complete sockets different styles.

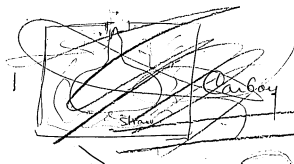
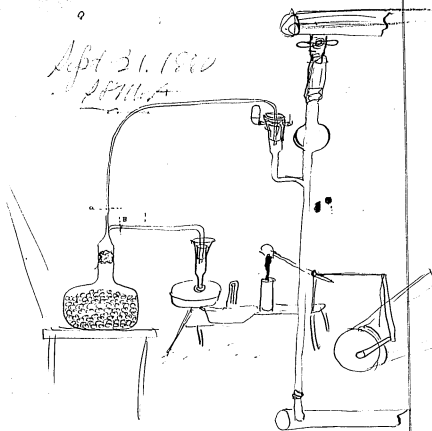
Patent -



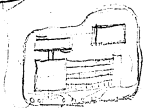
Sept 31 1880

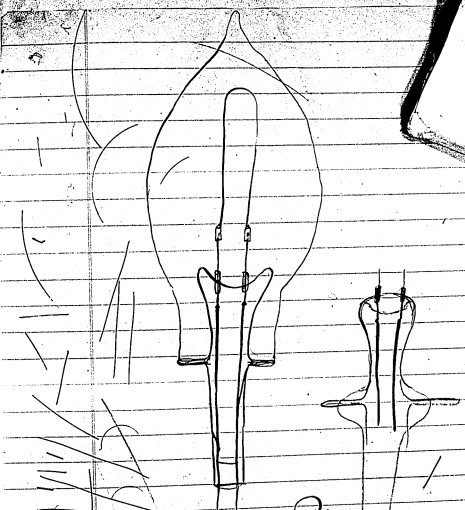
Edison

Sept 31. 1880
PENNA



Calcut





Patent

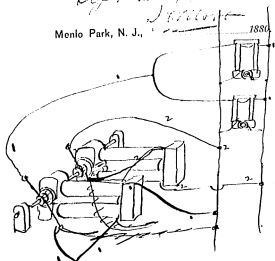
Sept 21 1880

Wm. H. ...



T. A. EDISON,

Sept 21 1880
Menlo Park, N. J.,



Patent

The Edison Speaking Phonograph Company,

66 READE STREET.

GARDINER G. HUBBARD,
President.

E. H. JOHNSON,
Secretary and Treasurer.

New York,

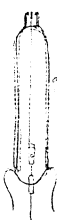
1890

Page 11

Edison

Edison

S. H. M. H.



The Edison Speaking Phonograph Company, ^{INC.}

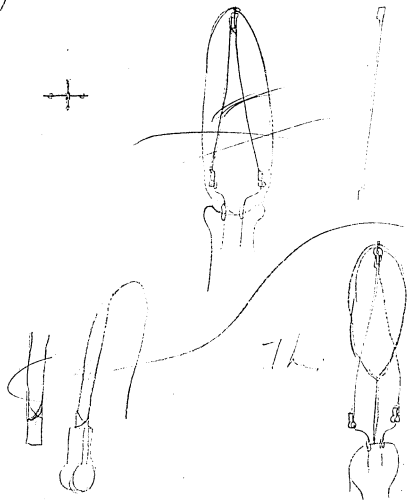
66 READE STREET.

GARDNER G. HUBBARD,
President.

E. H. JOHNSON,
Sol. y. of Trade.

New York, Oct 6 1879.

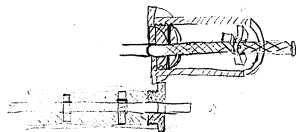
Page 2

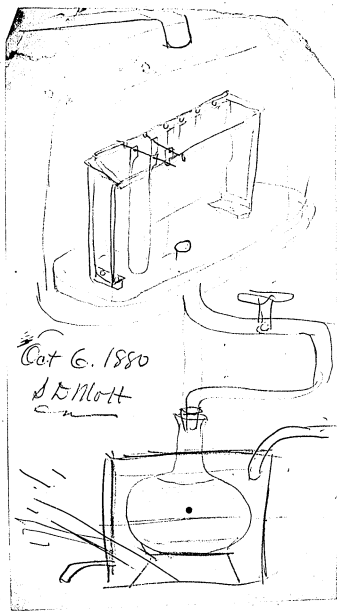


— October 1880 —

Oct 6th 1880

St. M. H.





— October 1880 —

T. A. EDISON,

Menlo Park, N. J.

1880.

Dec 8. 1867.
Wm. Larnam

40.
2
30.

421

$\frac{140}{140}$

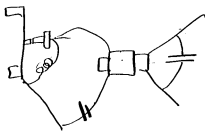
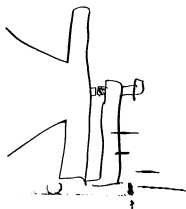
$\begin{array}{r} 78 \\ \times 96 \\ \hline 4680 \\ 7800 \\ \hline 75088 \end{array}$

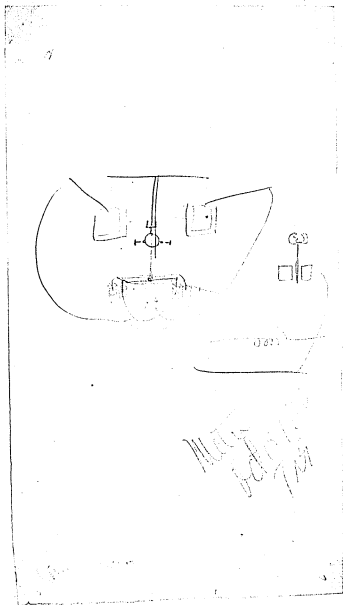
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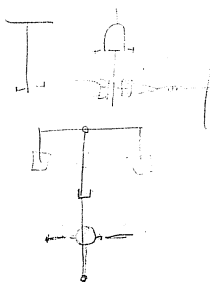
T. A. EDISON,

Menlo Park, N. J.,

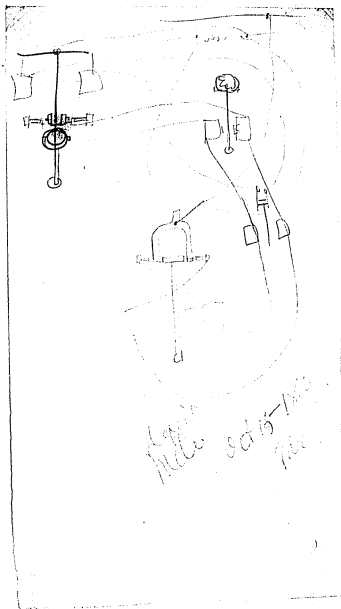
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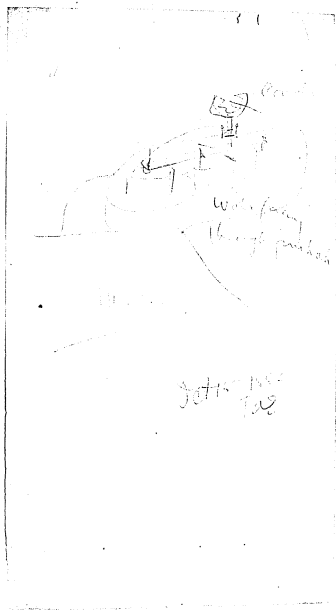




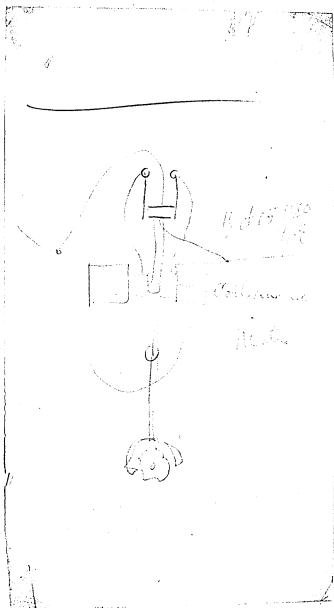


Meter
Oct 15/1880
7/1880

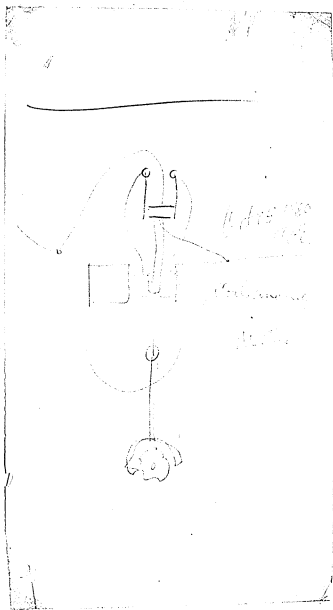


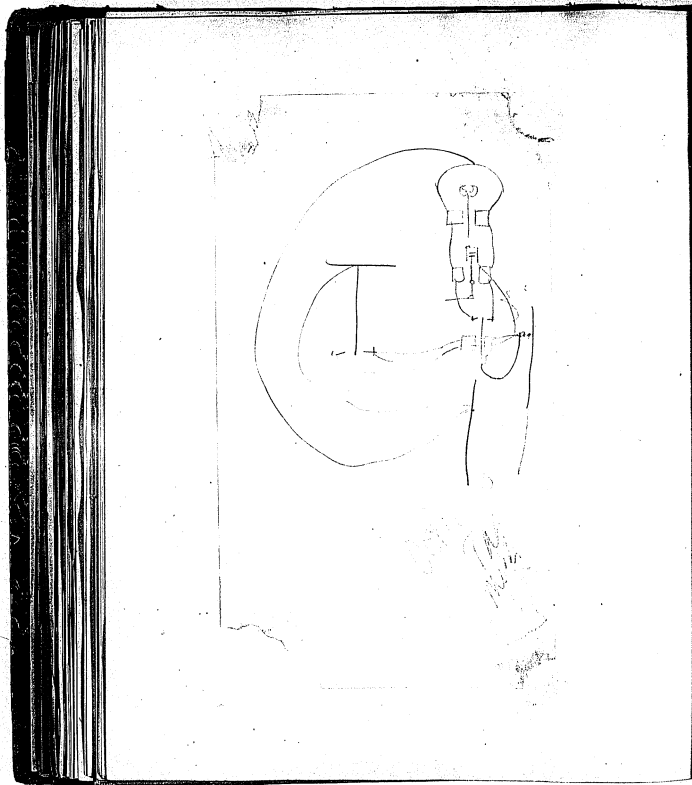


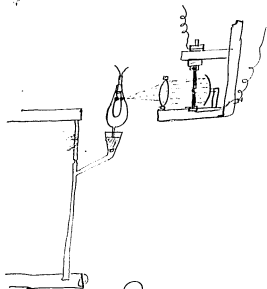
— October. 1880 —



— October. 1880 —

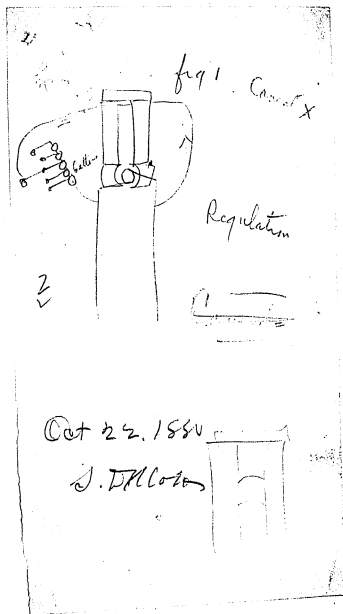


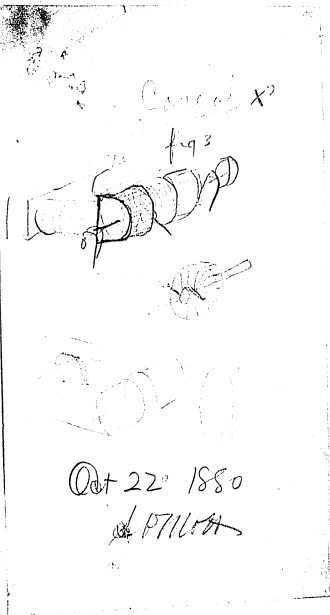




Patent

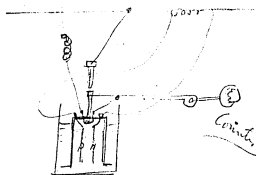
Oct 19 1880
Geo E





Oct 22 1880

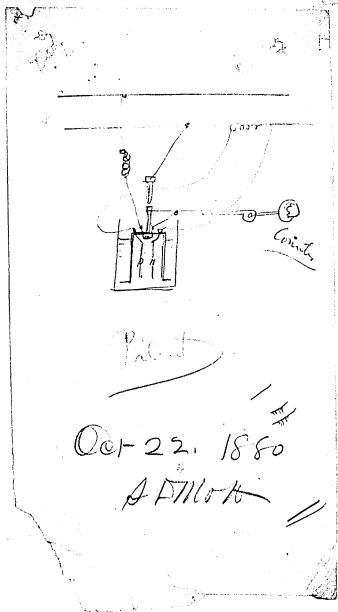
L. P. H. A.

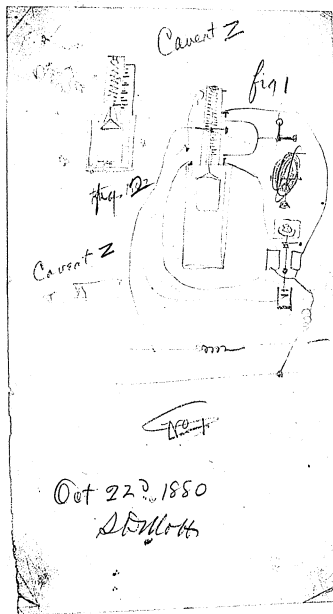


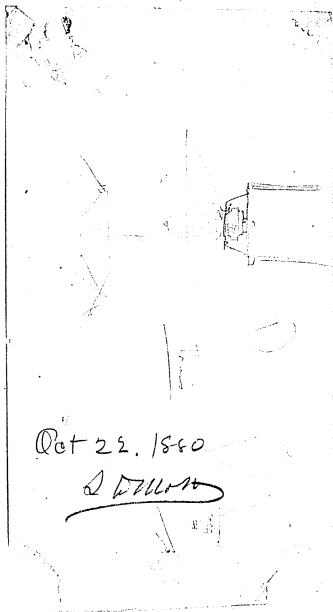
Patent

Oct-22. 1880

A. D. Mott

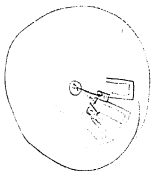






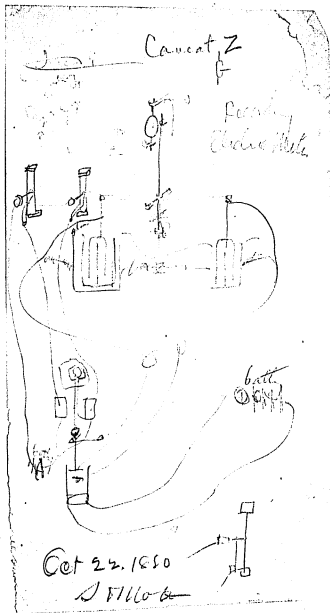
Oct 22. 1880

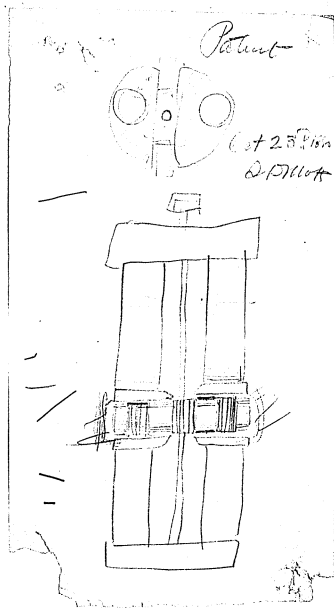
S. Miller



Oct 22 1880

S. T. M. 1880

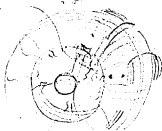




- October 1880

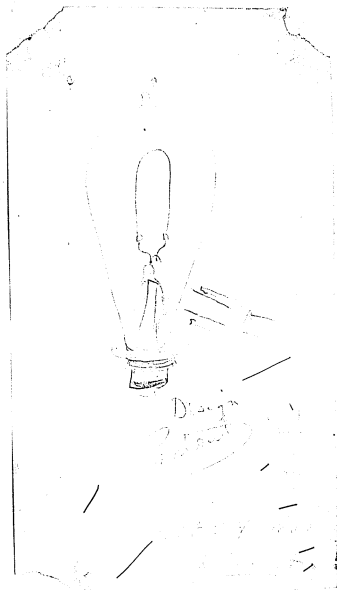
Oct 23^d 1880

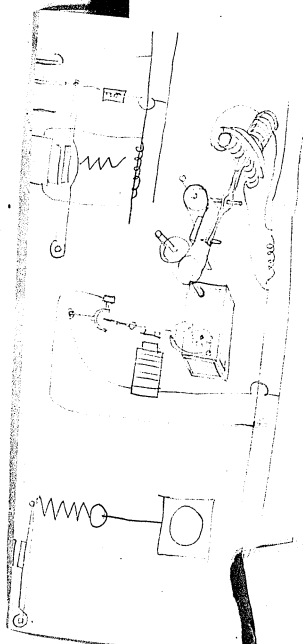
A. H. H. H.



Patent

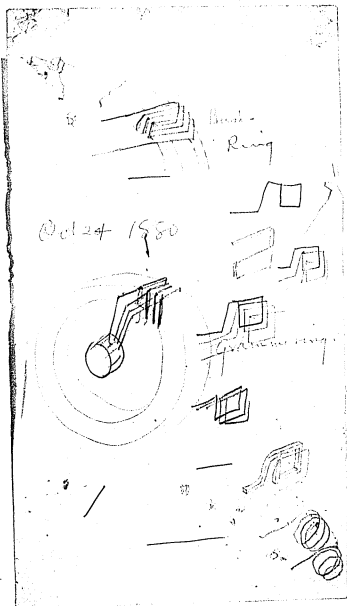






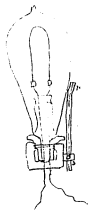
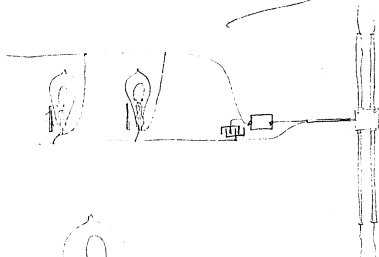
Oct 24 1980

Brake
Ring



1/10/80
1/10/80
1/10/80

Nov 27 1880
TAE



Mr. R. H. H. H.

Oct 27 1880

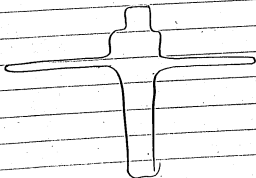
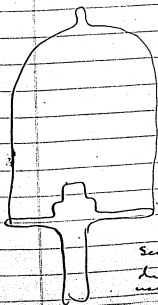
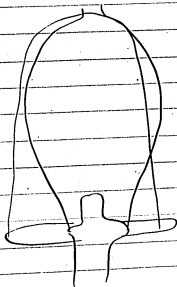
—November 1886—

Nov 27 1886

W. H. W. W.
Chas. R. R. R.



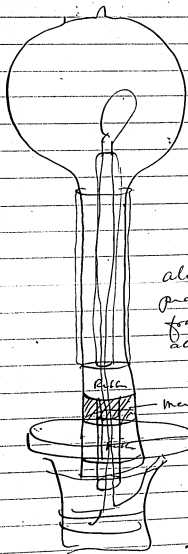
Dec 6 1880 T.A.B.



Sealed & globe to be cut off by
human & used again always
very weak part

Dec 18 1880

Q. 1



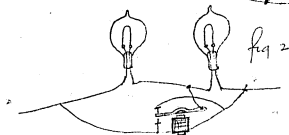
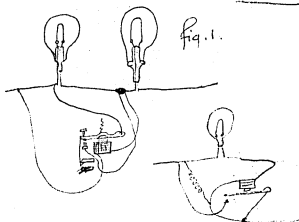
— December 1880 —

— THE EDISON ELECTRIC LAMP CO. —

Thos. A. Edison,
Chas. Batchelor,
Francis R. Upton,
Edward H. Johnson.

Menlo Park, N. J., Dec. 16 1880

1671607b



THOS. A. EDISON
CHAS. BATCHELOR,
FRANK R. Upton,
EDWARD H. JOHNSON.

Menlo Park, N. J. Dec 16, 1880

St. Louis

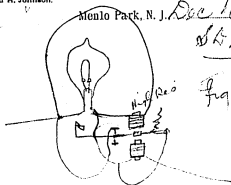
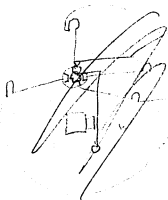


Fig 3



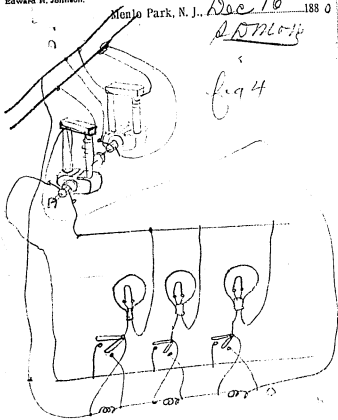
Thos. A. Edison,
Chas. Batchelor,
Freddie B. Upton,
Edward H. Johnson.

Menlo Park, N. J.,

Dec. 16 1880

Edison

fig 4

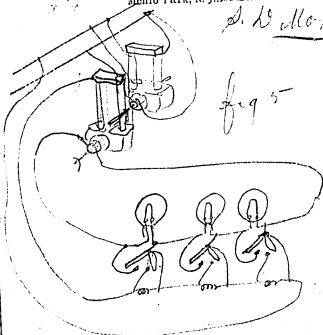


THOMAS A. EDISON,
CHAS. BACCHLER,
FRANCIS B. UPTON,
EDWARD H. JOHNSON.

Menlo Park, N. J. Dec 16 1880

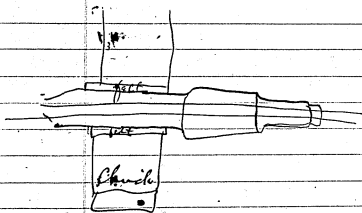
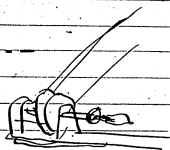
S. B. Mott

fig 5

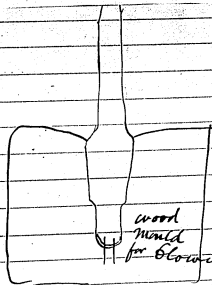


Dec 18 1880

Dec



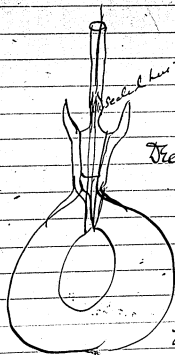
for grinding glass stopper Vacuum Lamp



Feb 18 1950
JAG

wood
mould

for blowing blank moulds
for stopper parts
for jamming
stopper vacuum parts



Dec 18 1880

DoE

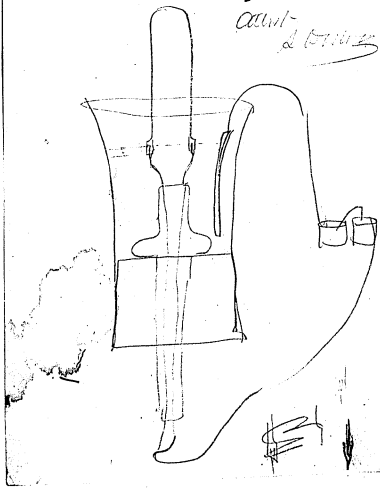
used old vice stopper with
6 Lamps.

Hoop Dr De

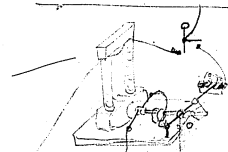
Paley Dr De
London

Patent. Dec 24 1880 *
TAG

attest
J. H. H. H.



Die 24. 1880 949



Mantl-
Patent

1880

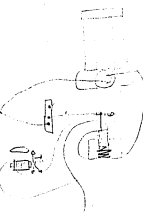
T. A. EDISON.

Menlo Park, N. J.,

1880.



1



2

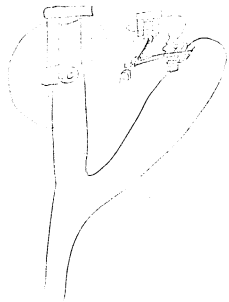
Alfred
J. H. M.

VIII 380

XIX

XXIX 332

(3)



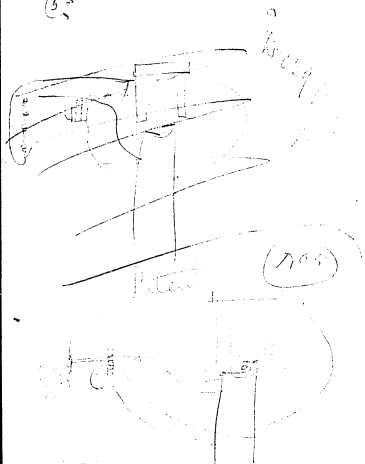
Atter

St. M

Menlo Park, N. J.,

1880.

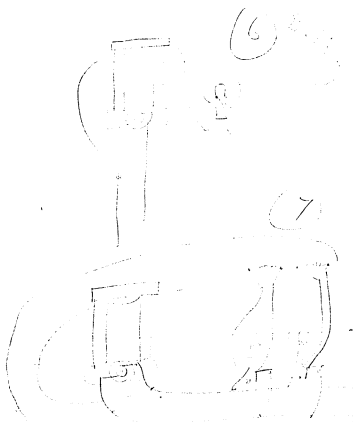
(5)



Attch. 1 H. C. 9

Menlo Park, N. J.,

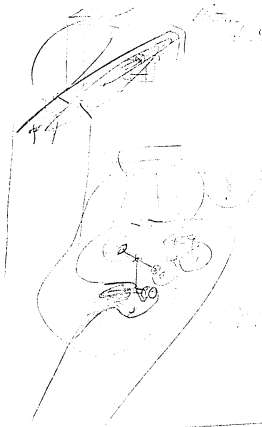
1880.



Artist R. B. Hill

Menlo Park, N. J.,

1880.



Laboratory Notebook, Cat. 30,101

This notebook is by Charles Batchelor and covers the period July-August 1878. It contains notes and acoustic recordings from an investigation of noise on the Metropolitan Elevated Railroad, along with notes and drawings of the aurophone and megaphone. The notebook is similar in style to the thirteen soft-cover tablet notebooks that comprise Unbound Notebook, Vol. 8. The cover is labeled "Laboratory Notes Number 62 T.A. Edison, Menlo Park, N.J." It also contains an inscription, written by Batchelor: "Experiments to determine the cause of the noise on the Metropolitan Elevated Railroad." About 30 pages of this unnumbered book have been used.

LABORATORY NOTES.

Number 62

*Experiments to determine the cause of
the noise on the Metropolitan
Elevated Railroad*

T. A. EDISON,

Menlo Park, N. J.

Elevated railway noise

July 3rd 1878

Charles B. Bletcher

- 1 We find that every joint is made directly on the cross tie
 - 2 We find that in riding inside the car there is more noise where there are upright side rails to the road and a great number of cross girders -
 - 3 We find that in most places when the cars go over, the rails sink about $\frac{1}{2}$ inch showing the rails to be lifted up by heat or otherwise.
 - 4 We find that the lattice girders some of which are weighted in middle act as reeds and continue the vibration for a long time after the train has passed
 - 5 We find that the part between Chambers St and Grand St is wide (say) with many spans far apart.
 - 6 We find that the diagonal cross rods vibrate strongly
 - 7 We find that nearly all the rails butt together leaving no room for expansion although that might be with the excessive heat today.
 - 8 We find that trains run slower (a little) do not make as much noise perhaps it would be better to stop and start quicker and run slower.
 - 9 We find that most of the noise is due to the hammering on the rail joints by the trucks.
- Edison & Bletcher 10 Bow and

Elevated Railway Noise

July 5 1898

Harshatchelor

10

On the track we find that there is a sound produced by trucks on ends of rail

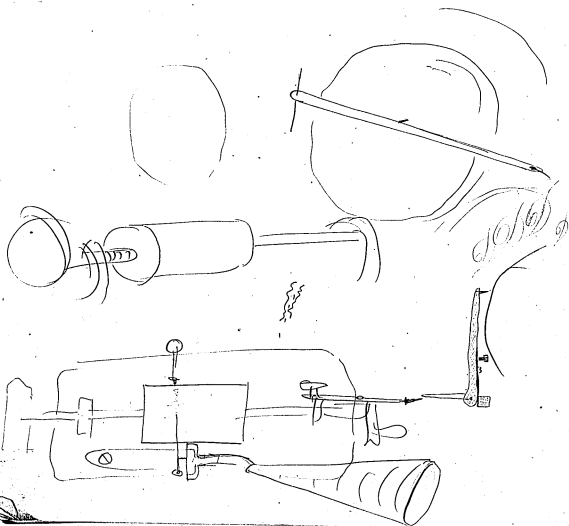
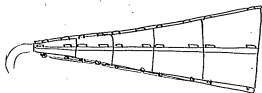
Also sound produced by wheel passing over every tie as it is much more solid on ties than between and the difference makes noise then again can also be noticed a knock peculiar to the wheel passing over every cross beam these all help to make the noise

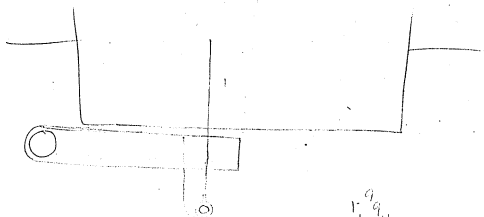
Edison & Harshatchelor \$10 hours each

Megaphone

July 6th 1878

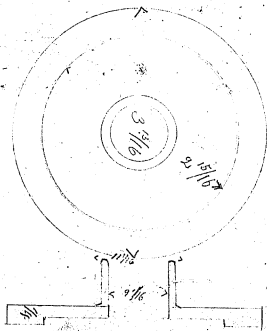
Charbarchetor





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Monographs for
experiments on Elevated R.R.

July 1st 1915

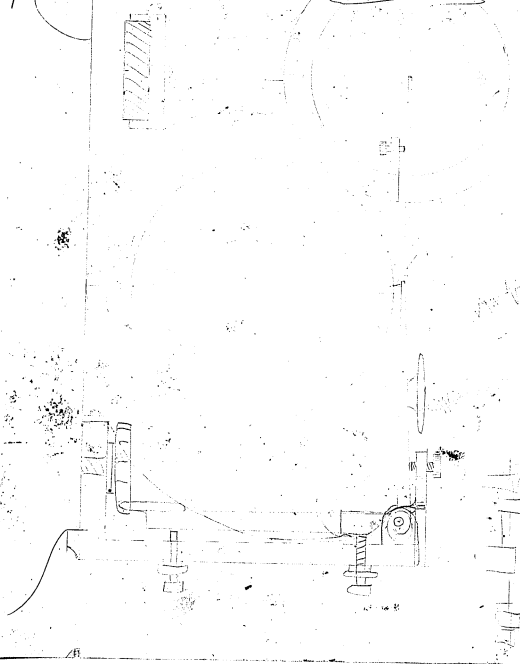
Chas. S. Sichel

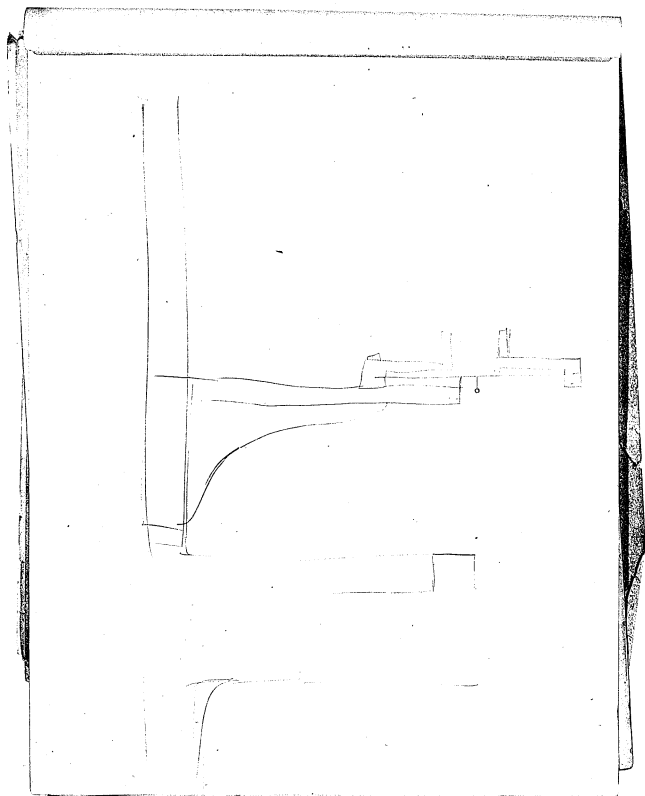


Photographs for
experiments on Elevated R.R.

July 1st 1915

Charles Kellogg

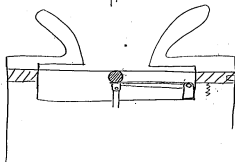
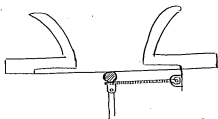




Acuphone

July 7 1948

Sketch below

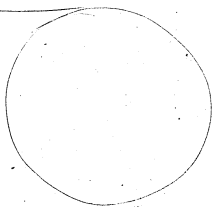


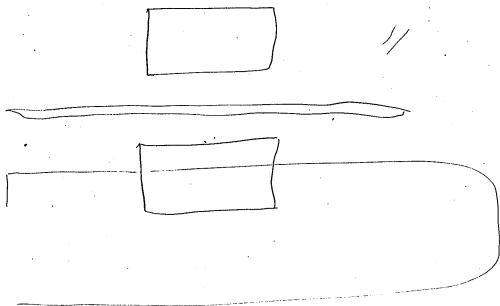
You will have to make the lever pretty light



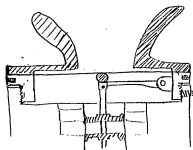
Can't be put together just yet?

Kruesi put a small lever on centres in this fastened to the rod by pin and sheathed to diaphragm with a piece of solid rubber between. You will have to put a ring of metal between the mouth piece and the body of casting in order to raise diaphragm high enough.



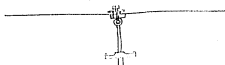


Aerophone



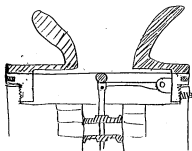
July 7 1878

Charachetor

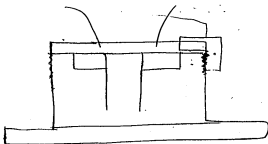
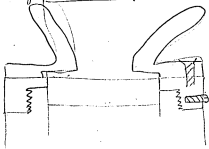


Aerophone

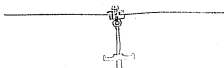
July 7 1898



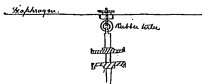
adjustable ring



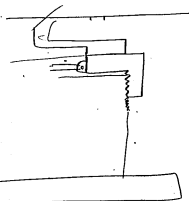
Charactetector



High tension



adjustment on diaphragm



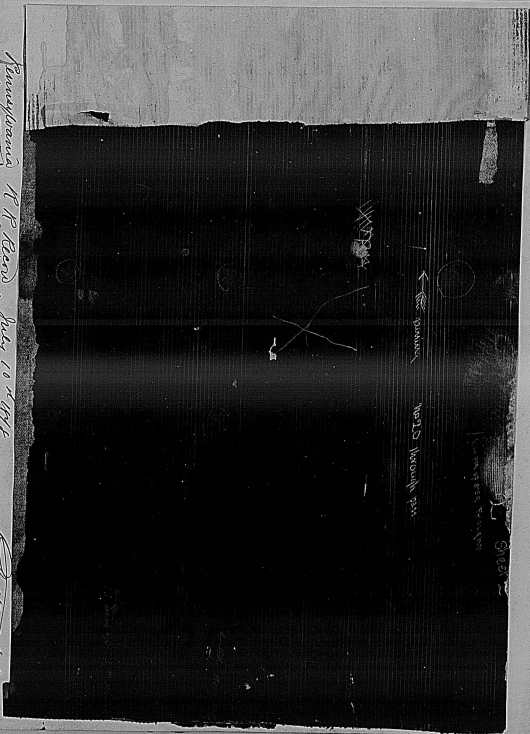
Chenopodium 17th March July 10th 1894.

Chenopodium



Memorandum H.P. Bond July 10 1891
is, last word in checked up with July 10 1891

Mr. H. H. Bond



Donaghavan N. R. Reed

July 11, 1945

Robertson



Metropolitan Elevated R.R.

Aug 14th 1898

Chas H. Bateman

- 1 In taking records from window on C Ave I notice that the noise from a car that had curtains round the wheels and also one that a wooden box round the wheels was less than any other train but very little.
- 2 I notice that there is a roar caused by the wheels resonating in the hollow bottom of the car. The car ^{bottom} is a hollow box about 4 or 5 inches deep and when the train is stopping and starting it is plainly heard to resound to the noise of the wheels over the sleepers and ends of rails. when at full speed this seems to be a fine roar.
- 3 In taking record I notice on the train that if I am in the end of train I get a ~~very~~ poor record whereas if I am near Engine I get very prominent waves therefore I think there is a great deal of noise due to the engine itself
- 4 Noticed also from window on C Ave that when Engine alone passed made a great deal of noise although it

gave poor record owing to it going so slow

- 5 Tapping for exhaust is very difficult and when the train gets too great a speed we stop and take again when it slows down a little.
- 6 On Aug 19th in tapping for crossgarden we had the machine out on end platform and at got very poor record although machine was sensitive I think it was due to being so far away from engine.
- 7 Between Blecker and Grand coming down is exceedingly fast and they run very fast there sometimes.
- Aug 21st

POCKET NOTEBOOKS

The thirteen books in this series consist primarily of notes and drawings about telegraph devices and batteries. They cover the period 1867-1873 and most of the entries are in the hand of Edison and Charles Batchelor. The first book was probably begun by Edison in 1867 and contains drawings of telegraph apparatus, geometric forms, and a list of books on telegraphy and electrical science. Some of the notebooks contain miscellaneous payroll records, accounts, inventories, and work orders. These are primarily by Batchelor but occasional entries were made by others in the Newark shops. Two of the books were used by Edison in 1873 when he went to England to demonstrate his automatic telegraph. They contain drawings of telegraph devices, notes on telegraphy in England, tests of the Greenwich cable, and street addresses of telegraph instrument makers. Many of the pages in the pocket notebooks are completely loose; the original order of the loose pages in the unnumbered books is sometimes unclear. The following books comprise this series:

PN-69-08-08	(1867-1871)
PN-70-10-03	(1870)
PN-73-00-00.1	(1873)
PN-73-00-00.2	(1873)
PN-74-00-00.1	(1873?)
PN-73-03-26	(1873)
PN-73-04-30.1	(1873?)
PN-73-04-30	(1873?)
PN-73-11-27	(1873)
PN-74-01-20	(1873?)
PN-72-00-00	(undated)
PN-75-00-00	(undated)
PN-75-01-01	(undated)

Pocket Notebook, PN-69-08-08

This notebook contains drawings and notes by Thomas Edison, probably from 1867, and personal accounts of Edison's father, Samuel, with one dated entry from August 1869 and other dated entries from January 1870 to June 1871. Almost all of the material by Thomas Edison is in ink and consists of 16 pages of drawings of telegraph apparatus or arrangements; two lists of books, mostly on telegraphy and electrical science; an unfinished table about relative electrical conductivities; and sketches of some simple geometric elements. The drawings include copies of telegraph repeater designs, some of Edison's own designs for repeaters, two duplex systems, and various relays. One book list and the geometric elements are widely separated by blank pages from the other material by Thomas Edison. The Samuel Edison accounts are in pencil and most of them appear in two groups, about 10 pages at the beginning of the book and about 20 pages at the end. The cover is marked "Memoranda." Approximately 60 pages of this unnumbered book have been used; about 30 pages have been removed from the book. Many of the pages are completely loose and their original order is unclear.

125.00
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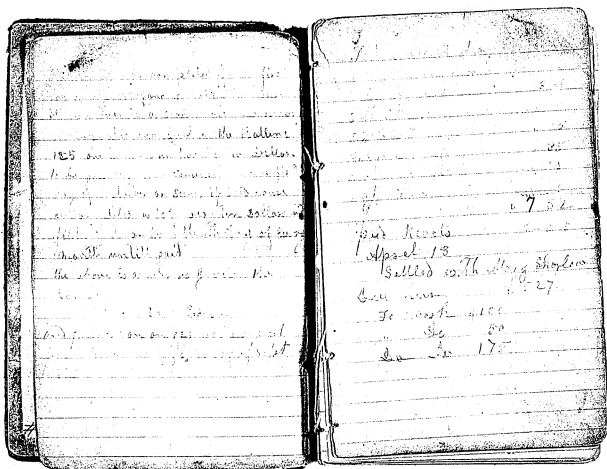
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Nov 10 Churchy Dr
 Jan House & Mill \$1200
 " 1 washing Machine 60
 " cash for Boots 200
 Dec 23 cash 60
 27 cash 40
 1 plug Tailor 10
 Lime 50
 Nov 4 To Cash 200
 15 cash 50
 19 cash 50
 28 cash 150
 Jan 10 Cash for wood 50
 13 cash 50

1340

January 18 1870
 Samuel Edison

Bought of Mrs Colwell
 The lot of land, she now owns
 Ex cept one acre on the south
 west corner of Redon Linton
 Road running 21 Rods East
 for \$250.00 To the said for as follows
 1 acre to hold one dwelling house
 16 feet wide and 24 feet long
 1 1/2 Stones high The house to be complete
 to be sided w. 1/2 of side and to
 have 2 or 3 chambers overhead
 1 Bedroom and Parlor 10 feet
 and 12 feet for hall stairs to have the
 1/2 one side and 1/2 the other side
 The side and the end of the side
 with the side The house to be built
 with the same kind of lumber as the
 kitchen of the house on the side
 on the side



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April 13

April 14

April 15

April 16

April 17

April 18

April 19

April 20

April 21

April 22

April 23

April 24

April 25

April 26

April 27

April 28

April 29

April 30

May 1

May 2

May 3

May 4

May 5

May 6

May 7

May 8

May 9

May 10

May 11

May 12

May 13

May 14

May 15

May 16

May 17

1880 Ridge

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June 15 1876

Received of Samuel Gibson

Twenty and 1/2 dollars to ably

Samuel Gibson

June 21 Samuel Gibson

24 1/2 dollars to ably

Samuel Gibson

July 12 Cash

To Building Loan To

To 41 Dollars

To 66 Dollars 25 Cts

To 100 Dollars

To 150 Dollars

To 200 Dollars

To 250 Dollars

To 300 Dollars

To 350 Dollars

To 400 Dollars

To 450 Dollars

To 500 Dollars

To 550 Dollars

To 600 Dollars

To 650 Dollars

To 700 Dollars

To 750 Dollars

To 800 Dollars

To 850 Dollars

To 900 Dollars

Bill 1, Santa Rosa Church
 House & Roof 618.00
 34 5/8" 25 00
 2 50 ft. of S. S. Lumber 95.00
 100 1/2" 175
 10 1/2" 25
 2 1/2" 1.00
 2 1/2" 1.50
 13 1/2" 50.00
 1 1/2" 75
 1 1/2" 25 1/2" 50.00
 2 1/2" 25 1/2" 50.00
 11 1/2" 50
 2 1/2" 1.00
 Carpenter Work 80.00
 61 35
 call at 50.00

Glass Sand
 North 10 70.00
 South 10 70.00
 37.00 10 70.00
 4 1/2" 135

August 22 1870

Dr. J. S. Burdett, Jr. - August 28th.

Hamlet 257

Page 200

Baker's Cove 400

Edith M. Carter 200

6-1-26

Glenview, Grand Creek St., Ar.

and other 1/1 1/40

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Nov 18 1914 250

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Alfred S. Chandler

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November 1 1911

Goodbye

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Task 4: 3, 4, 5

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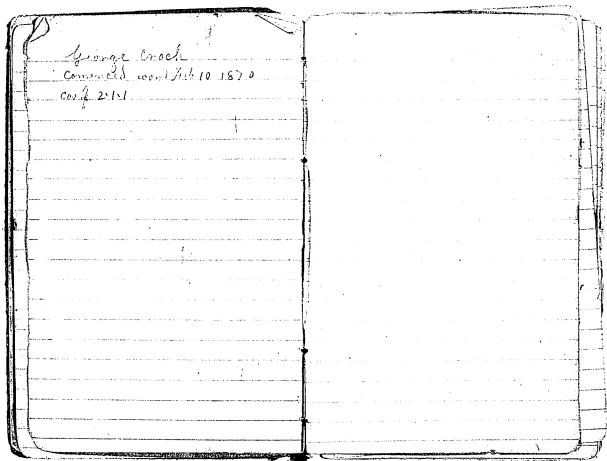
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www.pine.com

W. J. L.

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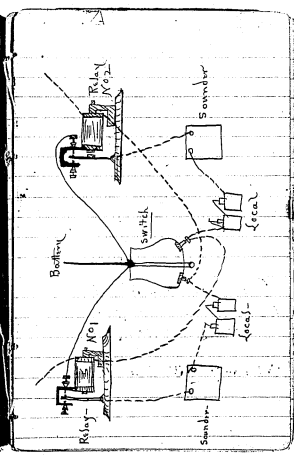
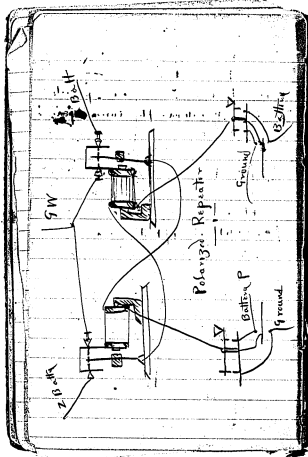


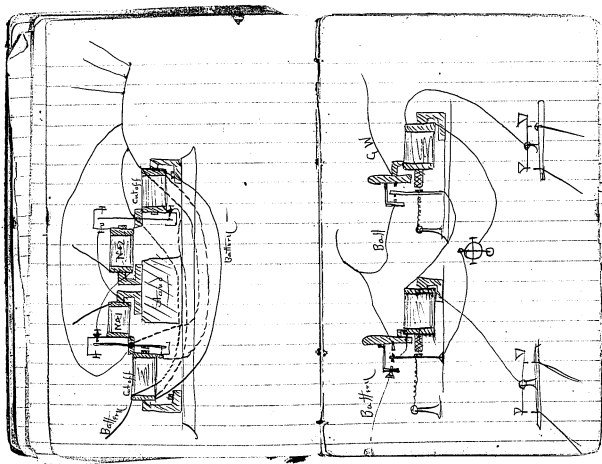
George Crook
Commenced work Feb 10 1870
Cos. 21st

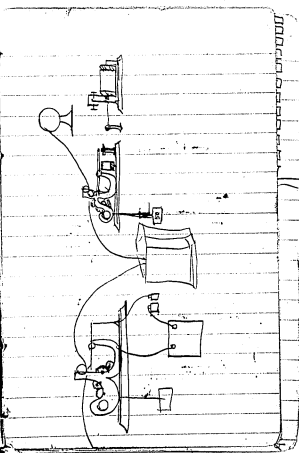
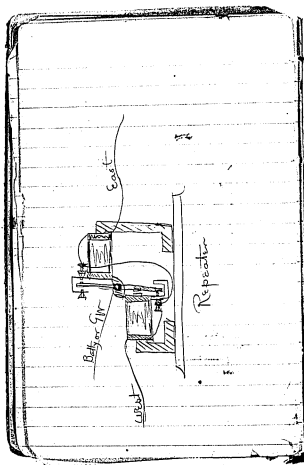
Further List of J. J. & S. Books
Faraday - Researches in Electricity 1 Vol
In Free Library -

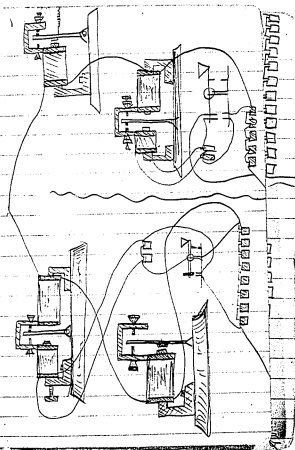
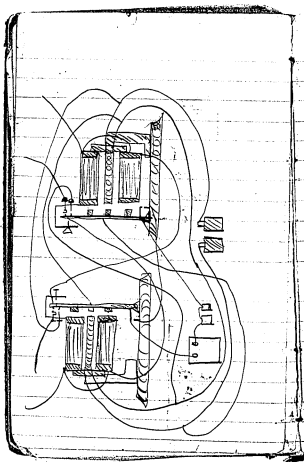
Electric Telegraph by Dr. Lardner
Entirely Re-written by Edward B. Bright
P, R, A, S. Ser. for the British & Irish
Telegraph Co. 146 Illustrations 8vo - 5s
- 1867 -

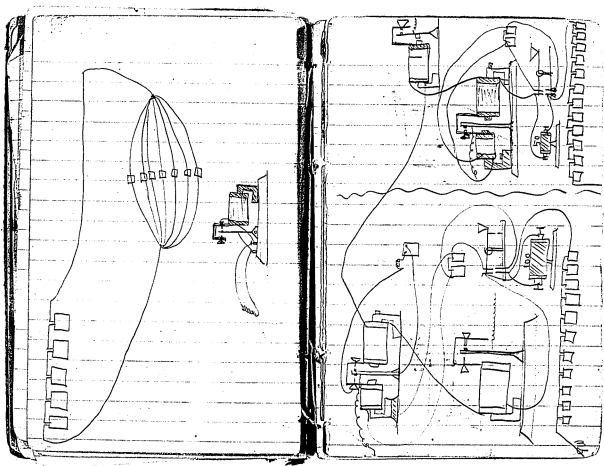
Handbook of Electricity Magnetism and
acoustics by Lardner Edited & completed
by G. C. Foster B.Sc. Prof. of
Experimental Physics University College
London New Edition Small 8vo 400
Illustrations Price 1867 - 5s

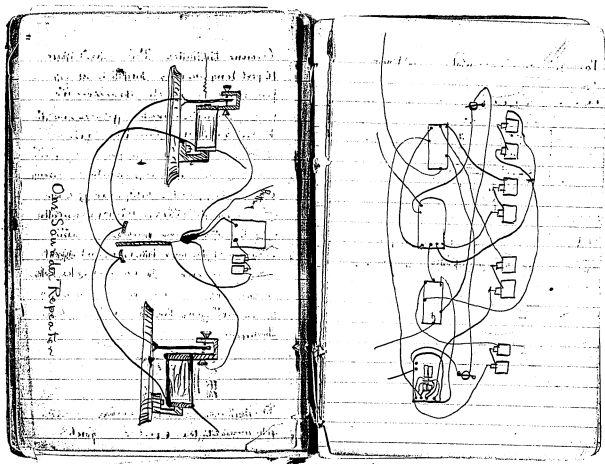


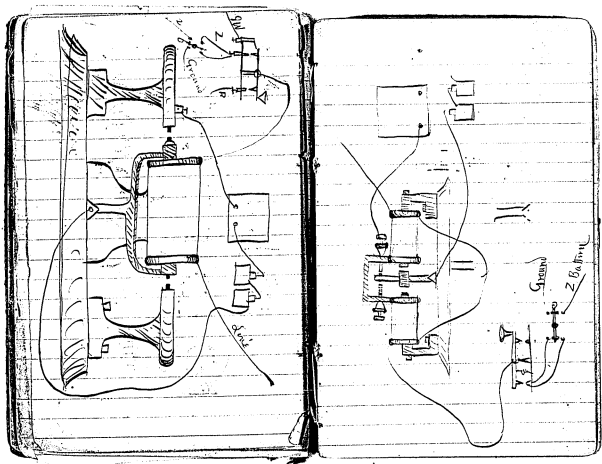


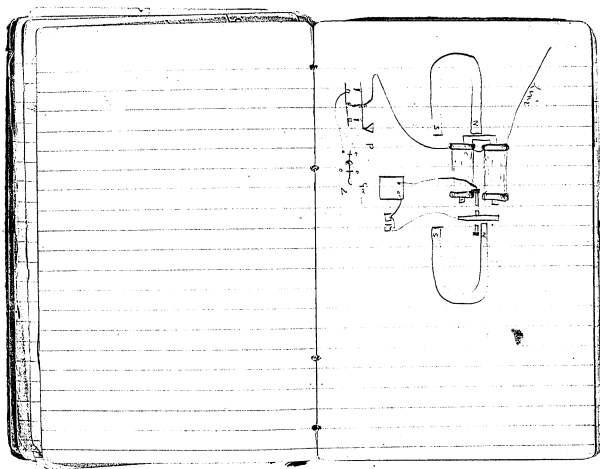


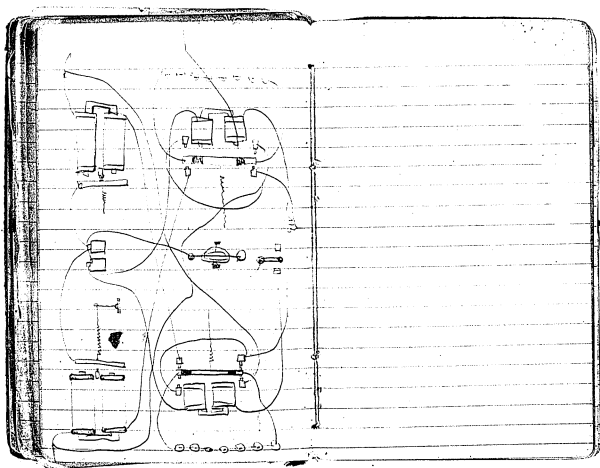












Conductivity Metals

Proedg Royal Society -

	Conductivity		Condy at 212°	
	5.1 in. 30°	100°		
Silver (standard)	100.00	71.46	100.00	
Copper "	99.45	70.27	96.20	

- No good -



June 10 1972

Luc. E. L. Olson

To Rent

\$140.00

69.00

~~\$71.00~~

Bill for Shovel

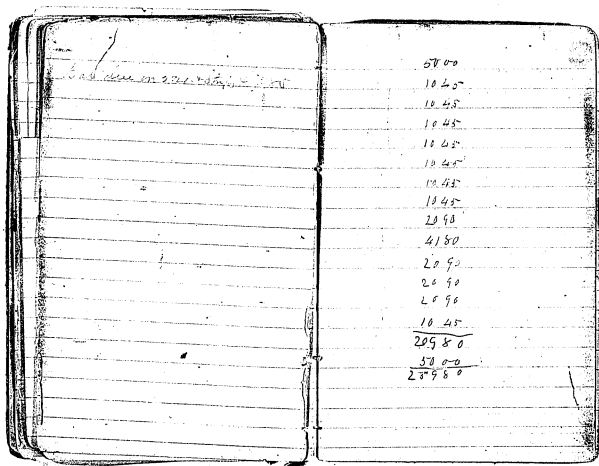
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- Books -

Culley - Practical Telegraphy - London

Wollan - Electric Telegraph Manipulation "

Dr C.C. Bombaugh - The Cyphering

III Edition Larger pub - Kurtz of Baste 550

pages - Curious & Literary puzzles

antiquated Cyphers 17 - Refer R. Table

Page 333 -

Sabina on the Telegraph pub - London 1867

price 6 dollars - Van Nostrand N.Y. -



Scalene Triangle



Isosceles Triangle



Equilateral Triangle



Acute angled Triangle



Right angled Triangle



Obtuse angled Triangle



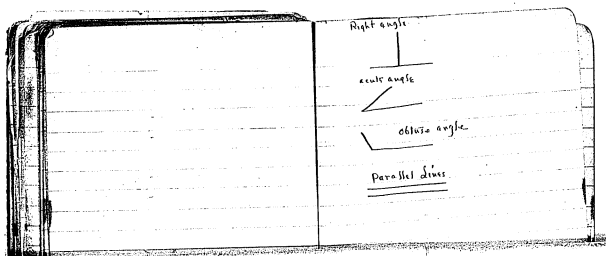
Quadrilateral Trapezium



Trapezoid

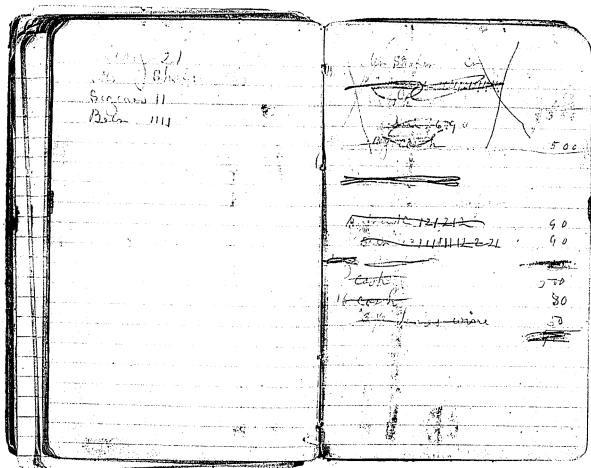


Parallelogram



Sales	
Cash Rec. Drunk	1.90
Bar	1.92
Cash	5.00
Cash on hand	80
3/4 pints wine	12
	5.10

May 24 1871	
Many Chaplains	1
To cash	1.25
6 " Cash	1.25
12 " 1 Base 13 cash	3.25
15 cash for Sunk	75
25 cash for Sunk	5.00
50 " 12	1.12
300 " 12	3.60
20 " 12 27 15	5.50
June 8 Cash 15.00	1.61
	<u>15.37</u>
4	1.00



Mr Cooper

2 railroads Rent \$50.00

By Cash 15.00

" Do 16.00

" Do 15.00

By Sister 15.00

" wife 15.00

March 12 cash 5.00

April 27 500

May 11 500

Bill of Lumber

Mr. Shas. Co. 10.00 10 ft

12 Red 10.00 10 ft

8 Green 10.00 10 ft

2 Yellow 10.00 10 ft

75-

8 9 2 5

5 9 2 5

7 9 2 5

9 9 2 5

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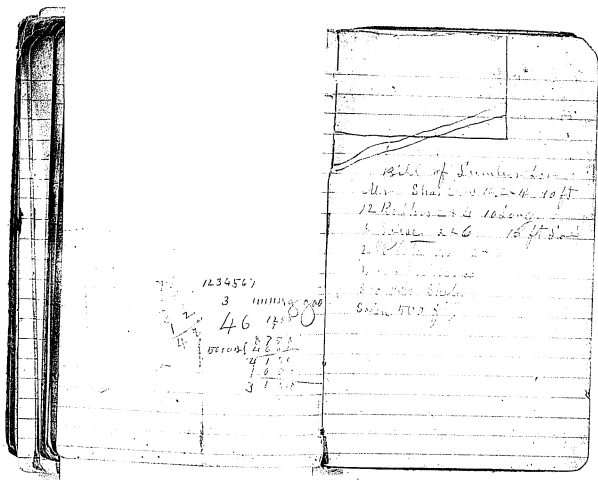
9 9 2 5

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1234567

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103

375

Bill of Lumber
Mr. Shal. 10.5-4-10 ft
12 Red. 10.5-4-10 ft
1. 10.5-4-10 ft
2. 10.5-4-10 ft
3. 10.5-4-10 ft
4. 10.5-4-10 ft
5. 10.5-4-10 ft
6. 10.5-4-10 ft
7. 10.5-4-10 ft
8. 10.5-4-10 ft
9. 10.5-4-10 ft
10. 10.5-4-10 ft
11. 10.5-4-10 ft
12. 10.5-4-10 ft

$$\begin{array}{r} 14 \\ 3 \\ \hline 42 \\ 3 \\ \hline 126 \end{array}$$
$$\begin{array}{r} 240 \\ 1 \\ \hline 450 \end{array}$$

Roller Aerial 29

See him on Settlement
L. B. 100

244

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10/16

Mr. Shoulton

3424

سید احمد رضا

7-4

~~607 Cash~~

Cash

Castro

6100

11200

100

$$\begin{array}{r} 120 \\ 30 \\ \hline 150 \\ 300 \\ 500 \\ \hline 2500 \end{array}$$

Mr. Shalaw &

Pay to Mr. Shalaw \$8.00

to under on Edge

Mat " 4.81

order on Shalaw 1.13

order on Clop 1.50

order on Shalaw 6.51

order on Shalaw 7.70

Jan 15. Shalaw Cr

100. Target Log 11111111.80

Shalaw 1.13

March 2. Shalaw 1.13

3. Cash 1.13

1.13

March 15. 1870

Pay to Mr. Shalaw 1.13

to under on Edge

Mat " 4.81

order on Shalaw 1.13

order on Clop 1.50

order on Shalaw 6.51

order on Shalaw 7.70

Dec 21 1870

Mr. Shalaw Cr

Dr. Shalaw 1.13

1.13

Cash 1.13

1.13

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of Rhodium

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Mr. Shadler
Plants 11 80
Cash - \$1.00
3 monthly 30
Cash 6 00
1 plant weekly 40
50

18.00
 18.44
 34.44
 123
 13.00
 177
 17
 223
 57
 177
 32
 212
 16
 13
 1/2
 2.00
 1.00

7315
 8.15
 5000
 12815
 177
 32
 212
 16
 13
 1/2
 2.00
 1.00

Pocket Notebook, PN-70-10-03, Cat. 1179

This notebook consists of twenty-eight unbound and laminated leaves, which have been numbered by an archivist. The entries are in Edison's hand. The first several leaves contain lists of machines, tools, office furniture and supplies, and accounts of personal and business expenses. There is also a one-page agreement of October 29, 1870 between Edison and Samuel W. Ropes, Jr. The latter part of the book contains descriptions and drawings of printing telegraph and other apparatus "Drawn at L Serrells office" on October 3, 1870 and a drawing of a chemical pen dated Oct. 10, 1870. The inside back cover bears the inscription "all new inventions I will here after keep a full record."

Blank pages not filmed: 11, 14, 16.

Species	1971	1972
Green-winged Teal	47	60
Lesser Scaup	10	34
Greater Scaup	11	11
Blue-winged Teal	4	66
Willet	34	56
Avocet	10	20
Black-necked Stilt	16	25
Red-winged Blackbird	24	60
Marsh Wren	11	20

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Truckload	12.50
Backhoe	14.75
Excavator	15.00
Grader	13.40
Roller	4.00
Crane	0.00

PN 70-10-03

E-6577-1

Oct. 1179

Sheets numbered in
circle on lower right
corner by N.R.S. 4/3/68
before laminating

1 Die casting Machine	495.00
1 Shaper	550.00
2 Engine lathe - large size	276.00
1 Shaper - large size	360.00
3 Work bench - small lathe	
2 Screen machines	808.00
1 Portable pump	
1 10' Air Mill	
1 Large Pneumatic machine	
1 Small	
1 Grand lathe - large size	
1 Shaper - 11' 6" x 14"	
2 Large shears	
10 Large shears	
1 Small lathe - large lathe	
2 Vices - at 5.75	115.00
1 Mill Press - 4 Spindles	360.00
1 Sheet Shears	
1 Sheet Shears	
1 Sheet Shears	

1 Brown & S. Milling Machine

1 Seven Sockets

1 Hand drill saw

1/4 Hand vice

2 Cutting Files

4 Hand screw drivers

4 Small 1/4 inch wrench

10 Pipe Trencher

6 Monkey wrenches

6 Hammer

1 1/2 S. Square wrench

2 Files

2 Chisels

2 Wrenches

3 Calipers

1 Steel rule

2 Drill bit holder

2 Pipe Plates

2 Copper Hammer

2 Box Assorted small wrenches

2 Burners Burners

1 Pair small metal shears

1 Rasp

1 Complete set of carpenter's

1 Metal miter Tool and Solder

2 Complete set hand drills

2 Pipe Plates

1 Pipe wrench

2 Soldering irons small & large

1 Nail Bit

1 Bit set in frame

2 Metal Saws

1 Steam circular metal saw

4 Hand Wires

1 Wrench

3 Stack & Pins

5 Nails

2 Lead hammers

1 Carpenter's rule

1 Tape rule

1. Microscope
1. Eye glass
3. Lacquer brushes
1. Relent stain
4. Oil Cans large
1. Large stove
35. Paper Curtains
1. ~~Kitchen~~ ~~acoustic~~ ~~check~~
2. Set figures
3. " Cellar
1. Turst Drill gauge
35. Oil cans
6. Air vices
40. Brushes
2. Cudirs
2. Bracem
3. Pails
1. Sink water
- Grass pipe & 35 Burners
40. Pipes
3. ~~Pin~~ Pines

1. Office Desk
1. Set Backs
20. Set tiles
- 1/2 ton assorted steel & iron
40. feet pattern wood
- ~~Paint~~ ~~brushes~~
140. feet benching
3. Partitions
- shelving for office supply and
- Tool room
20. Stools
3. Arm chairs
1. Milling rack
3. Large acid bottles
5. lbs solder
- Belling
- Hangers, shafting & Pulleys
3. Door Locks
40. Drawers ~~in~~ ~~wood~~
2. Sinter or Holes
4. Hand drill for metal

- 1 Soft essent. files
- 1 Leak-off glass
- 25 lbs. oil
- 1 Gallop Alcon
- 1 Gallon fuel oil
- 1 gallon shaft lubricating oil
- 1 " Lathe oil
- 1 C Polishing spindles ~~over 1000~~
- ~~assorted screw-wrenches~~
- 2 Tables box etc.
- 1 White Pet
- 1 Grinding wheel Bufile
- 1 H. wire
- 50 ft. rubber tubing
- 3 pipe slants
- wire
- 1 Metal lathe
- ~~turn rest~~
- 1 ~~the 2 clamps~~
- 1 sheet
- 1 Rust Pan
- 1 Tube Pines

- 1 Carpet for office
- 2 Paper " "
- 2 Ink bottles
- 1 Bottle of ink
- 1000 Ball pens
- 1000 Cards
- 1 Box Envelopes
- 1 Ream writing paper
- ~~1 Accounting Table~~
- 1 Pair Math table
- 3 Lambers
- 1 Pitcher
- ~~1 Washbasin~~
- 1 Bottle wash oil
- 1 Hair Scissors
- 3 Bedding Springs brass wire
- ~~1 Mattress~~
- 10 ~~1 Bed~~ 1 Bed brass wire
- 1 Mattress
- 1 Clock
- 1 Sprinkler

- 1 Chemical 13 x
- 1 Case haircuring Box
- 3 lbs Pumice stone
- 6 Cans 10 lbs each - assorted emery
- 100 sheets ~~assorted filling paper~~
- 6 cloth & sand paper
- 3 lb glue
- 1 lb Prussian Blue
- 3 lbs Soda
- 2 lbs fine unbleached lace paper
- 3 Lacquer glasses
- 200 sheets filler paper
- 3 funnels
- 1 Show Case for standards
- 1 Saw
- 1 ~~Sample of wood~~
- 1 Anvil Block
- 1 Hammer for same
- 1 Jeweller's Bell
- 1 Plane Square
- 1 Ruler

~~Machine~~
~~Surface Granger~~
~~Common Drill Press~~
~~Grinder with 10 blades~~
~~Anvil Block~~
~~Scissors~~

Belden New Haven

15 inch swing 6 gal. 300.00

Planer 24 inch sq. 530.00

Screw M 400.00

1250.00

Changes 1100.50

~~1100.50~~

Shaw & Sons Hammer

Smallest size 300.00

Expenses to Thompson & Edison

Oct 6	Cash	20.00
17	Cash	50.00
20	Cash	20.00

Edison to Thompson

Oct 5	Cash	31.00
Oct 6	Cash	20.00

ad

Base for golf 44.20	42.00
Hotel Fair	8.35
Freight	20.00
Byde	8.00
Flare	8.50
Microscope	2.00
ickets to fare	10.00
Palmer for pencil box	25
Expenses	64
Base	1.00
Tickets to the fare	30
Base short case	1.40
Expenses to Hines	50.00
Paid Sullivan Carpent	50.00
" Hype	50.00
Pelt Composition	40.00
Advanced oil C	11.30
lin sheet	1.06
Base a ticket for fare	25
Candles	65
Soda	②

Freight	4	99
do	7	50
do	7	20
Auto etc on acct	20	00
Weed Screws	30	
Gave farmer	2	00
Paid Man	11	25
Other Man	10	00
Expenses		75
Paid Farmer	13	60
Markwort	5	00
Nyde	30	00
Jones	400	00
Denton	150	00
Exp		30
Carpenter Matting	8	10
Paid to men & for files	309	87
Paid Nyde	50	00

Private acct

Gave Anger on	
Armed & Legal Pat	25.00
paid of man on	
Universal to 5th	6.00

Newark Oct 29 1840

In consideration of the sum of one dollar the receipt of which is hereby acknowledged I promise to pay to J. A. Eliou his heirs or legal Representatives one twelfth ~~to~~ undivided interest of all profits arising directly or indirectly from my Connection and relations and introduction of business etc with the Gold & Silver Telegraph Co. of N. York for a period of ten 10 years from date after paying receiving from them full payment of outlay by me or my own partner which is \$3,556

J. A. Eliou 10

Oct 24
List of tools to be purchased

- | | |
|----|-------------------------------|
| 1 | Forge & Blower |
| 1 | Anvil & Block |
| 1 | Large Back Geared Puncher |
| | Wire Plate |
| 1 | 602 Japex squarer |
| 1 | Rasp |
| | Oil Carpenter's Trestle |
| | Wire Plate |
| 2 | Soldering irons Large & small |
| 1 | Steel Fabricator |
| | Blank & Dies |
| 6 | Mallets |
| 1 | Tap die |
| 1 | Tap of size |
| 3 | Ringers Crutcher |
| 1 | Robert Shear |
| 4 | Large Oil Cans |
| 35 | Paper Crutcher |
| 35 | Oil Cans |
| 2 | Crutcher |

2. Prooms

3. Pails

1. Sink & Water Pipe

15. Nags

1. Office Desk

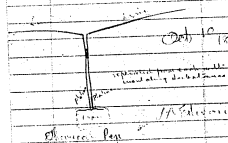
1. Tool Room Desk

1. St. Bench

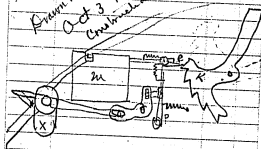
Lent Wann	25 00
Ropes	14 00
Emmet	5 00
Engelmann	5 00

Total amount spent	\$ 6,241.65
or Base Men	3,210.55
To Oct 5 - 1976	
leaving \$ 3,231.13 on Tools	

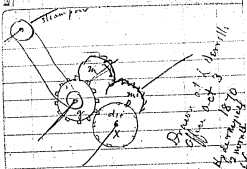
The union that Ehrlich
put on the first Model
of Pope & Edison



Drawn at L. Small office
Oct 3 1870
Combined 2 small before



Machine for preparing paper for
telegraphic purposes. M is punch which
is sheared at its end so that it will
shear the paper like shears instead
of pressing out X is paper driven
apparatus which steers the width
by the forward & backward motion of the upright
P. P is a knife edge feeder such as one
that it will move down but not upwards.
K is a key provided with cam teeth
of any number or required shape.
When the key K is depressed it gives a
number of back & forward motion to the
punch a paper drawing operation which
produces a letter.

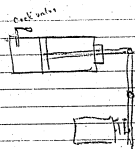


Plan for making type wheels for
Printing Telegraphy. The principle is
g is the wheel divided and rotated at
a equal velocity by stem & is a hardened
steel disc 1 M. 4 M are gear wheel
which mesh into each other and keep
the speed of g & x equal now by
fixing slowly the disc which against
the wheel g when in motion the disc
which contains sunk letters impresses
on wheel the letters upon the edge
of the tooth in wheel g etc

Quind carbon or carb and Black
Oxide Manganese a flux and
Make into sticks for a Reclanche
Manganese Ball - Written at
5 Swell, Office Oct 1870 = 10

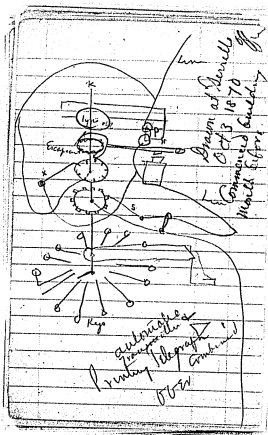


Rotating Battery to prevent polarization of the electrodes. The two elements are fastened to a shaft through pulleys running in a trough containing the reacting fluid, which can of course be replaced by a porous plate. The shaft can be of great length & contains any desired number of elements. It can rotate in any power combination or at intervals. (10)

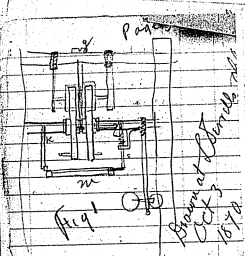


Design of Joseph H. Goff
 Oct 8 1870
 Made 1 Sept 1870

To produce a adjustable slow
 motion by means of a piston
 worked by a magnet or other
 power acting in a cylinder or
 on a lever and a cock valve
 The cock being regulated and the
 power applied to the piston it goes
 forward as fast as the air can
 pass through the cock which can
 be so regulated that an infinitesimal
 amount passes only or a large amount
 which takes time to give a stop
 motion to the piston

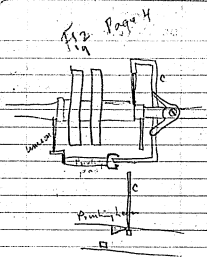


The shaft it has 9 wheels upon it the first is
a type wheel the second the escape wheel. Wheel
the third a brass wheel with thin insulated plates
round periphery upon which the spring V. finds
this wheel is so connected with the printing
agent P that when the shaft has been aligned
the spring V. is upon one of the insulated plates
which allows the current to take the front
agent to print but when the wheel is rotated
into position the spring V. being in contact
with the brass portion of the wheel it is
10 times as much as the insulated parts the
current is of too short a duration to afford
the printing magnet. The 4 wheel is
a brake wheel having a spring S. rubbing
upon the teeth upon its periphery this
wheel spring is connected directly
with the line and by the action of the
breakpoint it is made to make a break
in current of the magnet which gives it
action. Consequently it automatically
indicates upon the same principle
as the pointer Dial Telegraph of
Krauss & Co. upon the
end of the shaft is a disk which
is rigid & revolves with the shaft around
its path of a number of key which when
desired stop the shaft at its wheel
position etc.



Arrangement for rotating two
type wheels upon one shaft by
one escapement & one dog wheel
so that one type wheel can be rotated
while the other is locked & vice versa
This is done by a keyed variable
lock on the shaft of the type wheel

which is moved back by being
cammed by the cammed disk of and
cammed forward by the upward movement
of the paper beam or cam fork &
when the shaft is in a certain
position one of the type wheels
will be always carried around
except when the operator brings
the wheel into a given position
there by an upward movement
of the printing beam the type
wheel has then is locked to
the shaft & cammed around
but will be cammed back by
g unless he raises the
printing beam again etc
K is the universal apparatus
for turning the shaft at long
rotation at a given point
sustaining by the printing
beam etc



Same principle
as in Fig 1
Page 3

Triple Double Polarized Relay



Three long iron

Drawn off in Oct 3
1870
Completed 3
months before

Polarized Magnet with two long iron
but with but one pair of magnets
Three long iron are both pivoted in the
back of the magnet and by giving
them or pulling them closer to
one side of the other one long iron
will work on a positive current
the other on a negative current
very same that current is interrupted
like a common Relay and vice versa
when a negative is substituted with the
other long iron that can be so arranged
between the forks of the magnets that they
will only close when the current is interrupted
but not when it is interrupted

Ames

Die Sinken 7 Vire 55,00

4 Spool Drill Press 380-

5-foot Eng L 12" 400

7 in swing door v/able 3rd

1610

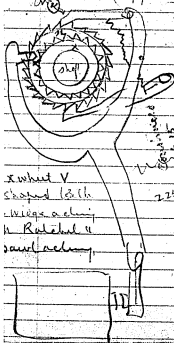
168.50

76-1452-00

Michajla Bozov

Sold \$1449.00

Escapement for Printing
Type & other apparatus

 ~~$K_a \approx 10^{-5}$~~

21

13



4

with

12

2

21

24

24

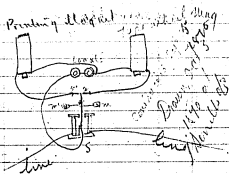
5



100

2

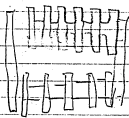
(24)



Means of working two magnet upon one wire

S is a polarized magnet if tongue is centered equivalent between the points of the tongue. When say a pulsation of negative electricity is sent through the tongue of relay S is attracted to point a & b. When say a pulsation of positive electricity is sent through the tongue of relay S is repelled from point a & b. When say a pulsation of negative electricity is sent through the tongue of relay S is attracted to point a & b. When say a pulsation of positive electricity is sent through the tongue of relay S is repelled from point a & b.

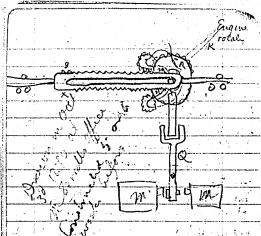
Electro Magnet



covered with wire in this form or turned out of solid stuff & placed in between the wire by means of these slots in the core coil he wound from



one end of the Electro Magnet by other filling all in one, so wire (29)



Mechanical Movement To

To transmit a continuous rotary motion into a back and forward motion gear long which

shall stop itself at each pf

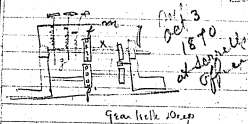
the point between which it

plays this is done by

having teeth at 90° & none at

45° & 135° & none at

flange which has a milled
gumby by the side of these
which is a arm which is rigid
upon the shaft upon the ends of
these arms are blocks movable
which rub along the milled
flanges now if the rack goes
forward the click engages
the milled teeth and
the gear wheel is locked to
the shaft which is the
rotated but the other wheel
goes in opposite direction is
not locked now when a
back motion of the rack
occurs the other wheel
locks & same shaft found
in same direction =



Gear Work Shop

Apparatus for punching
out the figures for the
amount of a check etc.
It is shaft with $\frac{1}{2}$ to $\frac{3}{4}$
diameter having 10 to 20
Ribs cut in it lengthwise
These ribs in the form of
gear teeth are on a plate
fig is a plate these plates
slide back with Racks
where the teeth of the
Racks engaging in going
down & back with the ribs

on & off are two wheels
not containing letters in
relief the other side in
they act like a punch. The
paper goes between them to be
punched. The shaft & has a
sliding bearing
Many number of keys can be
used on the key after the rack
is a guide press the wheel
down to wheel & punch

(2)

Shaper	550.00
Swing Grinding Machine	129.00
20 Vises at 5.75	115.00
2 Siren Mace	808.50
7 in Galt	
13 in Galt	} 1449.00
4 Drill Spindle Press	
Die Sinker	

305150

all new machine

I will hereafter keep
as full record

(28)

Pocket Notebook, PN-73-00-00.1

This undated notebook contains drawings and notes made by Edison during his trip to England in the spring of 1873 to demonstrate the automatic telegraph. There are notes on the Greenwich cable tests and on telegraphy from London to Liverpool. Approximately 90 pages of this unnumbered book have been used. Several leaves have been torn out.

$$\begin{array}{r} 200 \\ 200 \\ \hline 400 \end{array}$$

$$\begin{array}{r} 200 \\ 200 \\ \hline 400 \end{array}$$

$$\begin{array}{r} 200 \\ 200 \\ \hline 400 \end{array}$$

300

$$\begin{array}{r} 10125 \\ 1800 \\ \hline 11925 \end{array}$$

$$\begin{array}{r} 9750 \\ 375 \\ \hline 10125 \end{array}$$

$$\begin{array}{r} 2250 \\ 750 \\ \hline 3000 \end{array}$$

$$\begin{array}{r} 130 \\ 130 \\ \hline 260 \end{array}$$

Patented
London
Fairbank
Patented

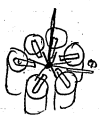
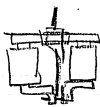
Patented (1873)

Arrange one or more
Condensers connected to
Earth with delicate
revolving armature
Engine having high
resistance spools to that
the Condrs will be
discharged ~~from~~ through
the engine & give a
constant rotation

Small magneto - no perm
Gramme Compound Int
prim applied w/ a wire
50 separate in a rack
Goal Chpr than Z...

ascertain if some magnetic arrangement could be made to attach to every knot or 10 K of a cable which should counter equal the electrostatic capacity of that number of knots, if they are constant. & increase & decrease with each other in the same proportion

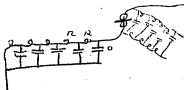
Disks Vulcanite faced $\frac{1}{8}$ circle zinc other $\frac{1}{8} - \frac{1}{8}$ C. each equal to zinc. revolve rapidly very close together, connect C with one side gal paper 2 with other. get induction



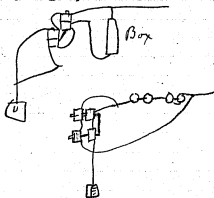


L

$$\begin{array}{r}
 13 \\
 600 \\
 \hline
 7800 \\
 3000 \\
 \hline
 8100
 \end{array}$$



or with magnetic it
might be wound
double thus



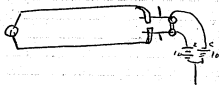
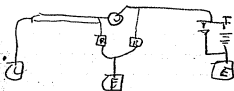
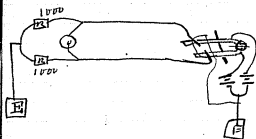
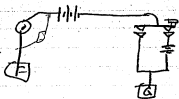


Resistance pretty dry
paper 1 Cup through
Minor Gal Thomson
500 000 ohms
with 5 Cells 100 000
Showing proportionate
to Cells applied

Thomson's Gal will give
quite deflection
through 4 millions
ohms
Mine gives dot
in 10 seconds through

1 Million ~~ms~~ ohms
~~1 Cup & 4 Minor~~
& down R of
500 000

With 5 Cups give
mark right along
hence to make
paper very sensitive
in high resistance
circuits add at
least enough cups
to just make a scarcely
perceptible mark
& work upon the battery
at other end this



705 miles cable

0000

130
10
1300

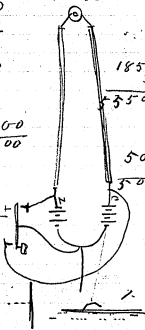
1800
13
5400
1600
23400

13
600
7800

1900
10
19000

1850
3
5550

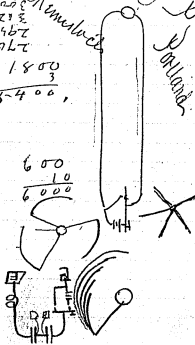
500
10
5000



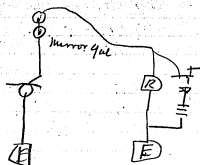
0000

1800
3
5400

600
10
6000



1 6000 ohm



Not failing at 20
words per minute
but could see that
at higher there
would be
Especially if the
Circuit or Resistor
for discharging
was increased

Tester says 1200
ohm Mirrors used
for receiving notes
low R

The internal resistor
of 300 those Galto
percha battery
is 37000 ohm
or $123\frac{1}{2}$ ohms per
cell or good

Length section wire
154.644 142

5467

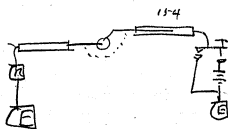
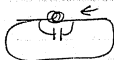
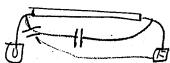
1 + 7.

2 + 3 — 187.071 344

5 — 130.662 546

6 + 7. — 140,596. 748

Tester says he & W. V. Smith
 watched Earth currents
 all one night at Valencia
 changed from P to N
 sometimes $\frac{1}{2}$ minute
 to other 15 minutes
 he measured potential
 one time Texas 50
 Cells =



joints near test o
 well as regula
 Corrs impossible
 make perfect joint
 Walbridge says
 guess that reason
 won't allow more
 battery = Chemical
 action =

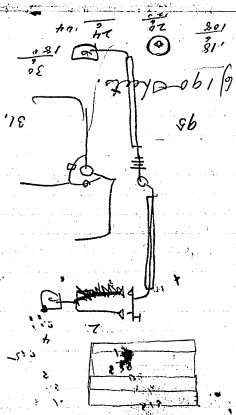
$$\begin{array}{r} 122 \\ 61 \\ \hline 183 \\ 122 \\ \hline 305 \\ 122 \\ \hline 427 \end{array}$$

$$\begin{array}{r} 122 \\ 61 \\ \hline 183 \\ 122 \\ \hline 305 \\ 122 \\ \hline 427 \end{array}$$

61 feet 1/2 copper wire
 61 feet 1/2 cap diam
 61 feet 1/2 cap diam
 61 feet 1/2 cap diam

$$\begin{array}{r} 130 \\ 101 \\ \hline 231 \\ 130 \\ \hline 361 \end{array}$$

$$\begin{array}{r} 130 \\ 101 \\ \hline 231 \\ 130 \\ \hline 361 \end{array}$$



$\frac{1}{x^2} = x^{-2}$

$\frac{d}{dx} x^{-2} = -2x^{-3}$

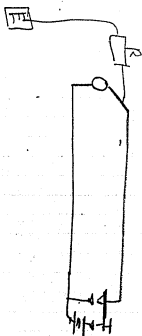
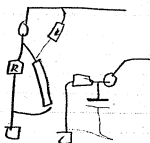
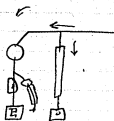
$= -\frac{2}{x^3}$

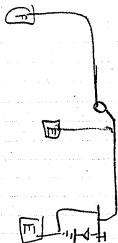
$= -\frac{2}{x^2 \cdot x} = -\frac{2}{x^3}$

[illegible]

200 - 5 male perla
to equal a condition of
each cost 6
equal 1/10 animals
85 for 1/10 ground

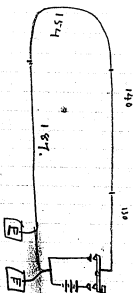
[illegible]
$$\begin{array}{r} 85 \\ 17 \\ \hline 85 \end{array}$$



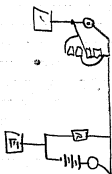


Greenwich Expt Metallic Circuit?

exact instrument and are performed
 paper see what speed obtainable
 with each section to each direct
 4-then with all sections on
 probable amount of high speeds cable
 on other side increase speed

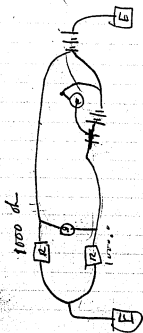


Charge cable fully
 + Kill or balance
 straight line by boxes
 magnets thus —
 & work quick with very
 small spaces



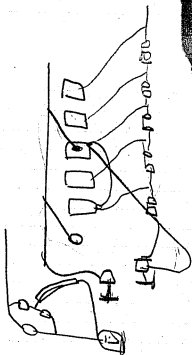
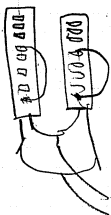
Quarter battery

Duplexing the static
 Charge



600

300.





Wm Siemens
 No 5 9 + George St

295

$$\begin{array}{r} 72 \\ 20 \\ \hline 1440 \end{array}$$

$$\begin{array}{r} 144 \\ 2 \\ \hline 288 \end{array}$$

6
8

3 1/2 miles
 320 C 10"
 320 R 10 miles creek

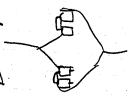
$$\begin{array}{r} 320 \\ 4 \\ \hline 80 \end{array}$$

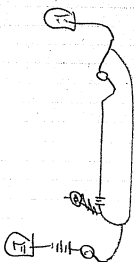
$$\begin{array}{r} 320 \\ 10 \\ \hline 3200 \end{array}$$

$$\begin{array}{r} 1200 \\ 10 \\ \hline 120 \end{array}$$

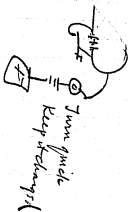
$$\begin{array}{r} 32 \\ 6 \\ \hline 192 \end{array}$$

also by the
 over

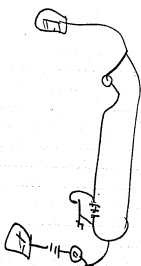




Class

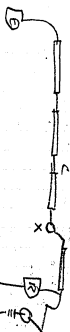
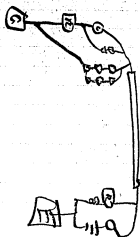


Turn quick
Keep it simple



Turn quick
Keep it charged

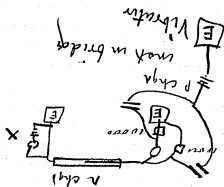
Greenwich



Then put X at C.

500 is a
minute
turn

Good I think
 Vary P chg battery
 full of unexchange
 case square to
 X Vano battery



1470
210

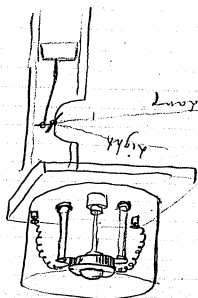
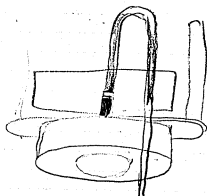
432
36
72
24
18

75
13
20
2

1.5

Core in magnet so
that it can be plain
& gradually made
Magnetic =

Heat Salnamaker



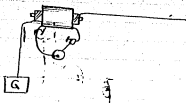
Light

Light

Cable perforation

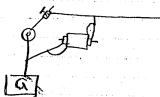
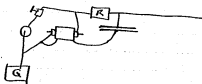
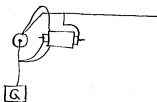
○ ○○○○ ○○ ○○○○ ○○○ ○○○○ ○○○○

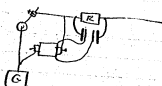
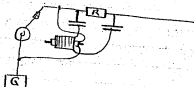
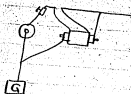
I h . 1 s . 1 s



Experiment on the thinnest
 & thickest paper for reduction
 of R. & sensitiveness

Organic & Inorganic colors
 paper bleached by ozone
 from pen.



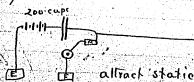


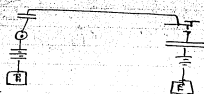
Test the length of the discharge
on a fine wire spool &
Coarse ditto with same
battery

Test quantizing a number of
very fine wire spools with
separate Cores, Then all
on one Core,

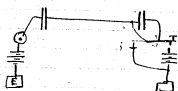
Test iron wire spools & magnets,

Magnetic hunt of Righ
Res & use low battery
power,





attraction of currents



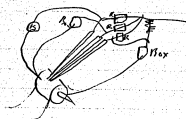
Magnetic Res with adjustable
Cores to vary discharge.

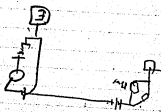
Cable Perforations

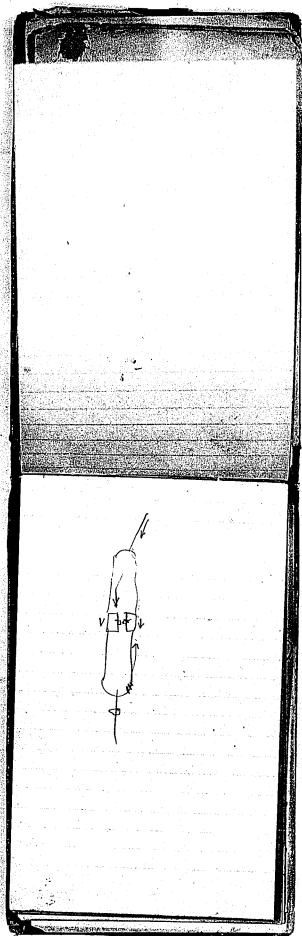
○ ° ○ ○ ○ ○ ° ○ ○ ° ○ ○ ○

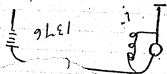
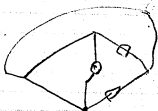
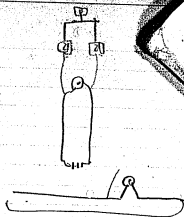


○ ○ ° ○ ○ ○ ○ ° ○ ○ ○ ○





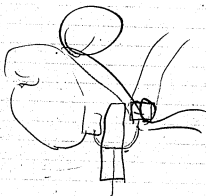




800
4
12

$$\begin{array}{r} 24 \\ 13 \\ \hline 72 \\ 24 \\ \hline 314 \end{array}$$

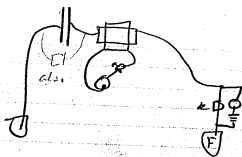
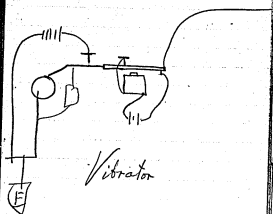
305

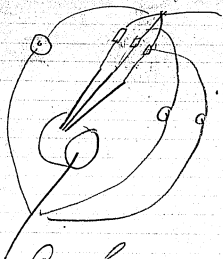


21

4
008

for high R Counts
magnets. Try
fine iron wire mesh
Copper & quartzite





Bythina

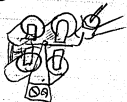


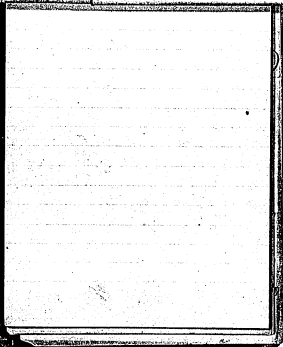
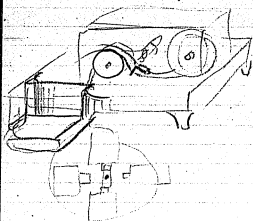
$$\begin{array}{r} 0.1 \\ 9 \\ \hline 85 \end{array}$$

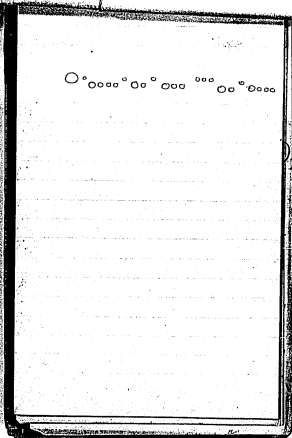
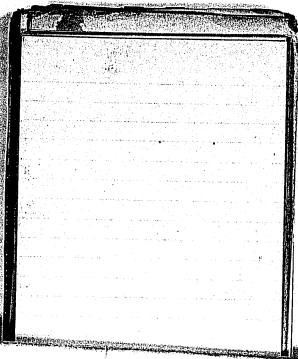
$$\begin{array}{r} 56.5 \\ 7 \\ \hline 85 \end{array}$$



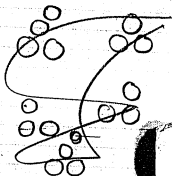
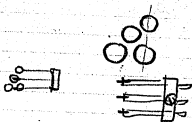
$$\begin{array}{r} 0.89 \\ 3 \\ \hline 85 \end{array}$$







for a half current
for a dash last
half write



Use only one hole large
for dash & make all
holes smaller
& sep pen would

have 3 connections
with wire coil put in
at work & write
Corder system at NY
with Chon of good
cord 3 Corder
1/2 way but W & Ch

Obtain the thinnest
page possible &
Experiment Exhausting
to Reduce the R of
the paper

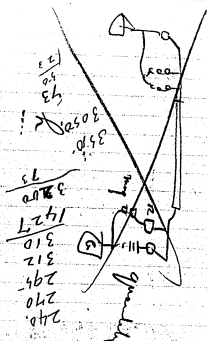
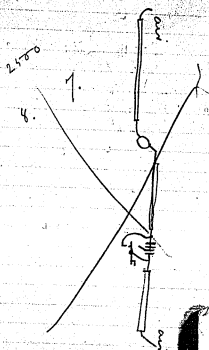
Also Experiment
of organic & inorganic
Colors to bleach
with the Ozone of
the pen =

from it reacts slowly & with
the
immune rapidly the dark
has one strip copper
See if influence would
be with E. + connect to
Demonstration

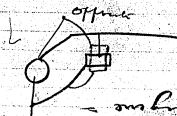
by the use of a dark
if made on which
is a strip of zinc
& of copper connected
cable = The dark
dark now another
dark 100 H. of an inch

within the current
to ~~use~~ so that it would
exactly neutralize the
static charge in
Schmady knots of
cable by their being
could be put in the
cable & their capacity
would remain as
constant as the capacity
of the cable - it would
be valuable -

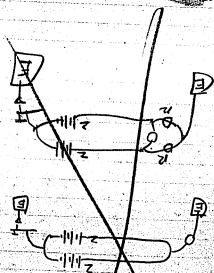
Greenwich



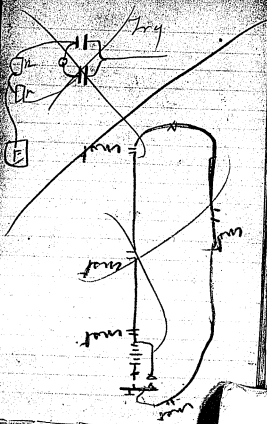
As certain of some
 magnetic arrangement
 might not be needed
 as to be included
 within the circuit



Change & discharge
 a large condenser
 or several large
 Condensers, through
 a very delicate high
 R. Engine - Resistor
 adjustment = do so
 to get a perfect
 resistance in the
 engine =

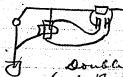


pressure

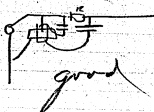


1 Knot.

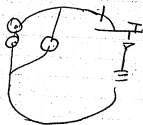
8 by 8.



Double Contact
high R Seedy
Chgs C Opposite



good



$$\begin{array}{r} 118 \\ 3.00 \\ \hline 354.00 \end{array}$$

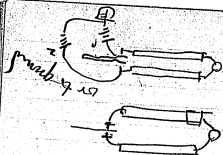
$$\begin{array}{r} 120 \\ 3.00 \\ \hline 360.00 \end{array}$$

$$\begin{array}{r} 122 \\ 3.00 \\ \hline 366.00 \end{array}$$

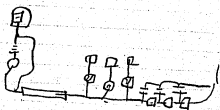
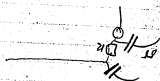
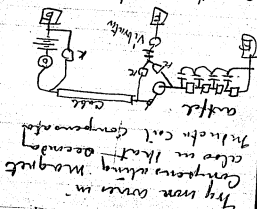
$$\begin{array}{r} 124 \\ 3.00 \\ \hline 372.00 \end{array}$$

$$\begin{array}{r} 123 \\ 3.00 \\ \hline 369.00 \end{array}$$

$$\begin{array}{r} 123 \frac{1}{2} \\ 3.00 \\ \hline 369.00 \end{array}$$



connecting in it



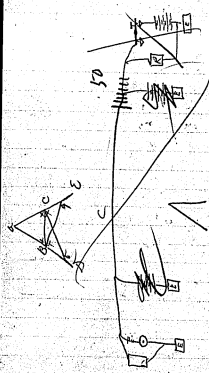
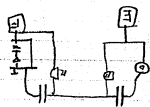
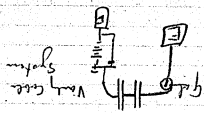
See if through 500,000
 ohms anything can be
 put with the 30 ohms
 that will reduce the
 resistance and obtain
 the mark with one cup
 of battery = an looking
 the arrangement of
 lodged p.p. but with
 one or two cups battery
 through 500,000.
 through the resistance
 try and see which best
 2 cups Bessel or given
 will give the mark
 quickest =

It may be that
 signals may be given
 with 20 cups given

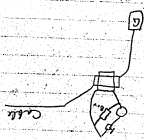
4 cups by 20 cup
 Bessel

Bessel's battery
 have 6 foot square
 lead sheet or coils
 Bessel's battery
 made to be used at
 necessary and that
 Bessel's battery
 I get later a
 condition but have
 the arrangement
 that Bessel's
 long Bessel change
 I then Bessel
 they be that the
 cannot be put
 in the main if so
 place in about

try this. obtain some
 nickel that will no
 decompose while in
 when attach it to the
 platinum pen so as to
 reduce resistance



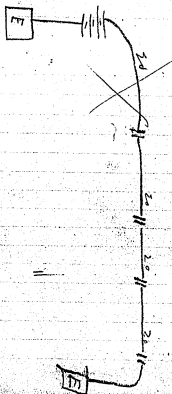
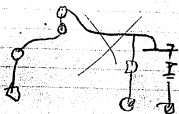
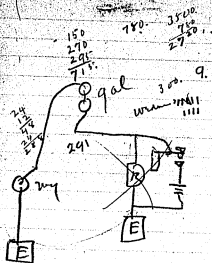
Station Wagon
 Wharf Road
 City Road N



It is probable that the
 return magnetic charge
 can be obtained free &
 with less shunting of the
 current by this arrangement
 than directly by magnets
 The primary coil should have
 probably 5000 turns

It might be well to try &
 see if the deflection of the
 beam might not be increased
 by keeping it stationary
 changed or
 by passing a current (local)
 in opposite direction through
 it or by the addition of
 a second cup in the
 direction current it was
 no box in the
 When I get home have
 1000 cups glass 1/2 size
 Cate glass cups made
 for battery of 2000 cups





Pocket Notebook, PN-73-00-00.2

This undated notebook contains notes and drawings made by Edison during his trip to England in the spring of 1873. There are drawings of telegraph equipment, circuit diagrams, and notes on experiments. The book also contains a note on overhead wires in England and a list of English telegraph instrument manufacturers. Approximately 60 pages of this unnumbered book have been used. Several leaves have been torn out.

PN-73-00-00.2

Thompson
 2.50 1011
 56 m 1/4
 [E] [G]
 Fork
 Fourteenth
 Fork
 Fork today

101
 1/5 1013
 2.50 today

Fork today
 Fork today
 Fork today
 Fork today
 Fork today

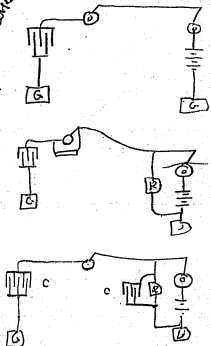
High Inst makers
 Henry Izant & Co 408 1/2 Oxford St W
 Chas Wm Meiter & Co 854 87
 Grace Church St EC 11
 Bishopgate Ave EC 4 St Leonard
 St Bromley E
 Frank Russell & Co 2 Talbot
 Court Grace Church EC
 Julius Sax 108 1/4 Russell St
 Bloomsbury WC.

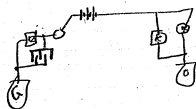
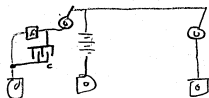
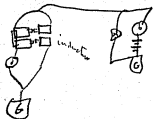
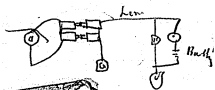
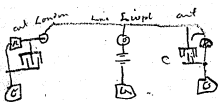
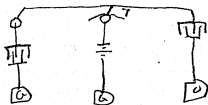
Zuber & Rieder Morse bell pagers
 Louis Hende agent 3 Bridge Row EC

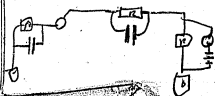
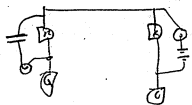
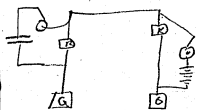
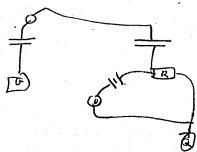
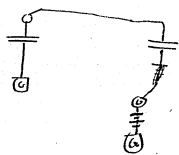
Load. 11 & 12 Break st
 Regent St.

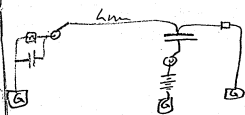
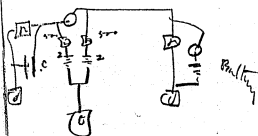
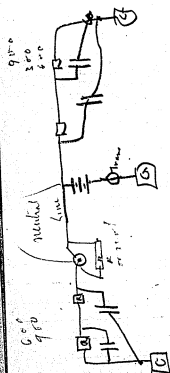
Horatio Yeates
 39 King Square, Grosvenor
 EC
 R Faulkner Second Hand
 Affairs 40 Endell St W E

Woodwork - Foxcroft, 54 Compton St EC
 11 EC



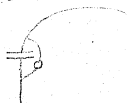
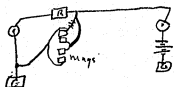




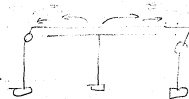
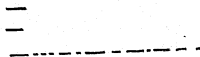


Pot 90d - 750.
750.

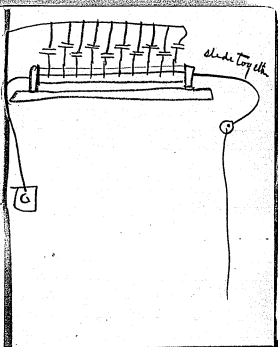
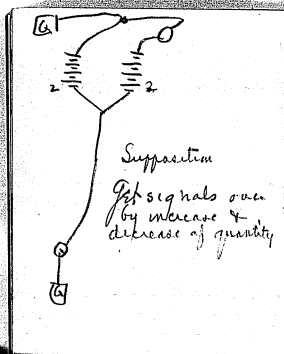
2800.

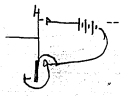
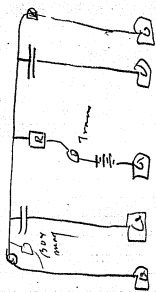


Get a resistance coil
German Silver wire
wound opposite



also





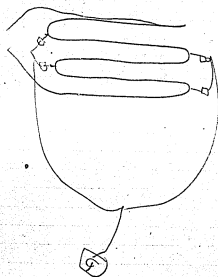
$$\begin{array}{r}
 900 \\
 40 \\
 \hline
 940
 \end{array}$$

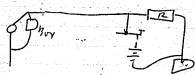
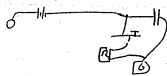
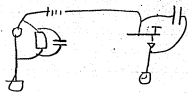
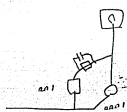
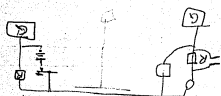
$$\begin{array}{r}
 7000 \\
 73500 \\
 \hline
 80500
 \end{array}$$

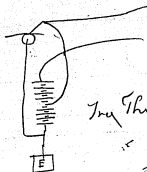
$$\begin{array}{r}
 48 \\
 1350 \\
 \hline
 50
 \end{array}$$

$$\begin{array}{r}
 290 \\
 1740 \\
 \hline
 2030
 \end{array}$$

$$\begin{array}{r}
 500 \\
 4700 \\
 \hline
 5200
 \end{array}$$



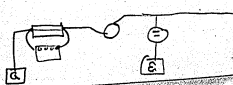




Try This

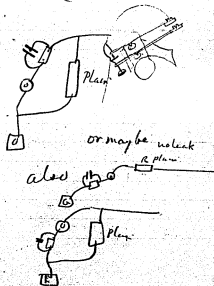


Buy 60 Bunsen or
Box Grove Quantity
by PO get that Conden
Connect Thus



Take out 4 rolls or 8
paper

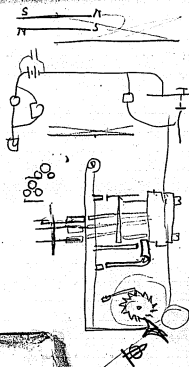
have Wright connect
 $\frac{1}{2}$ & $\frac{1}{2}$ battery in
quantity



if I do as well or better
with 80 Connected for
quantity 40 + 40 shch
The error lies in not
having a quantity battery
of 80 to supply the shunt

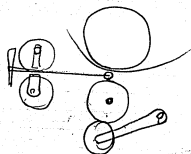
in printing punchings
Electric Engine and
Letter at time p & n
vibrator and etc

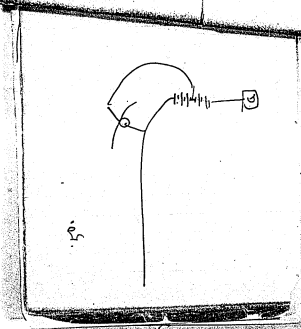
Iron paper make some



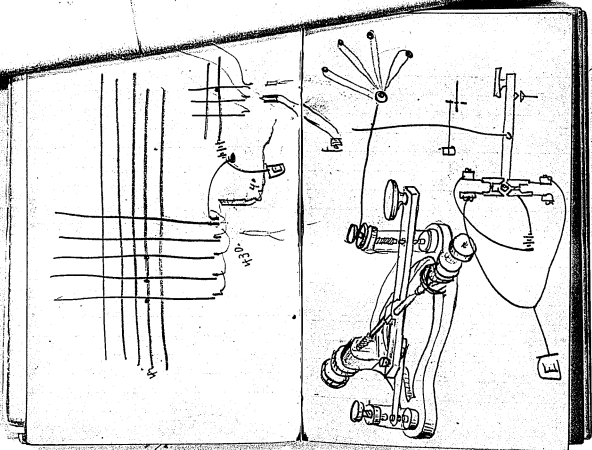


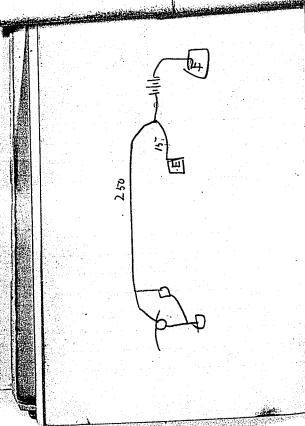
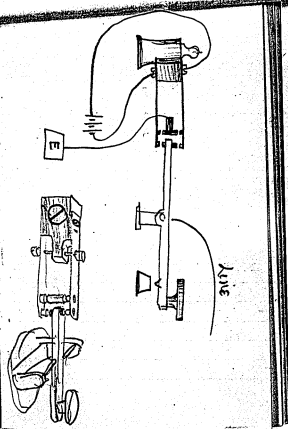
induction current
continuous

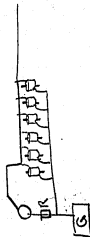




25.

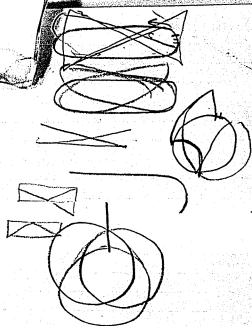
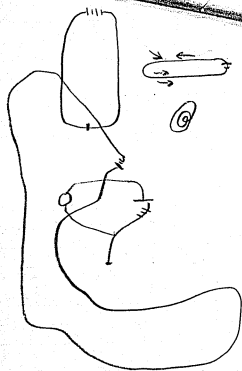






8 coils
Each coil has 5000 ohms finest
best wire perfectly insulated with
a bundle of well annealed iron wires
for cores. The resistance should be
same otherwise leakage discharges

5000	2000	5	5%
6			
2 10-	6.	10	5
2 5			2 1/2
2 1/2	1500		
2/	2500		
	1250		
	625		



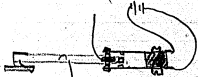
J E Wright
NW Hotel
Liverpool

NW RR Receiving
Nearest Rwy
off London & NW
off Piccadilly
Circus

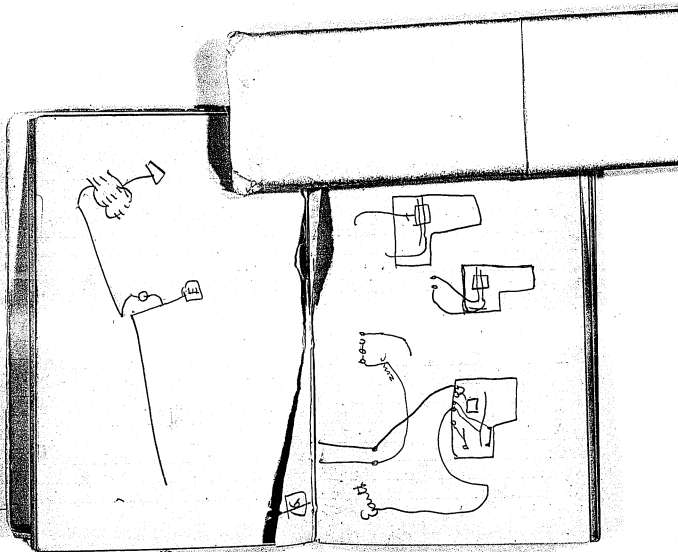
M Threlter
86 Cannonbury road N.

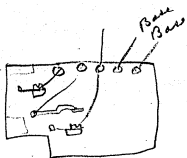
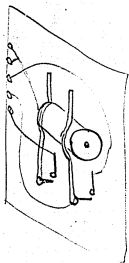


Clock
heat req paper



Clock Top
1/2 size paper





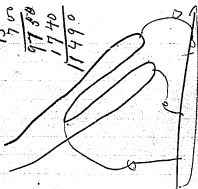
150
650

290
1740

70 13
1700
9788
1740
11490



4



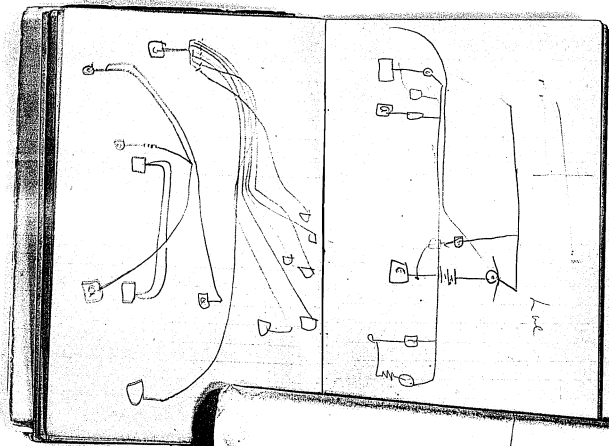
11490
Chas R Bg
Cable

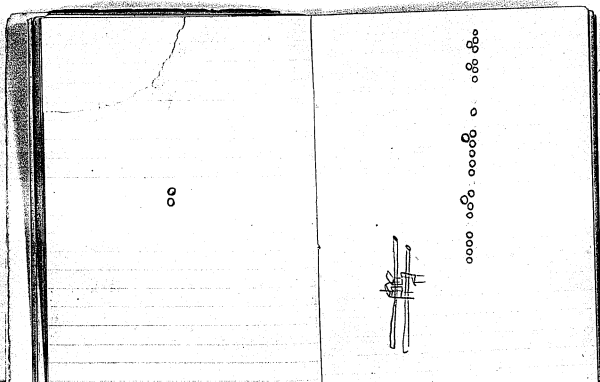
Address of man interesting
himself in Auto at Hammam.

Mr George Matlow Abell
Solicitor
Gloucester
Eng.

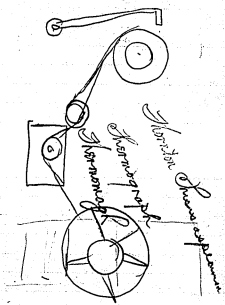
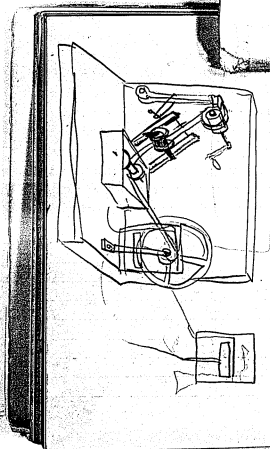
1500

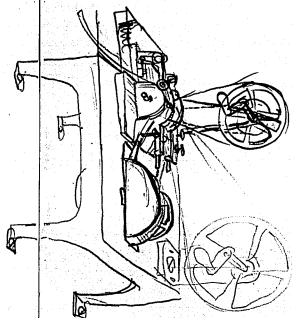




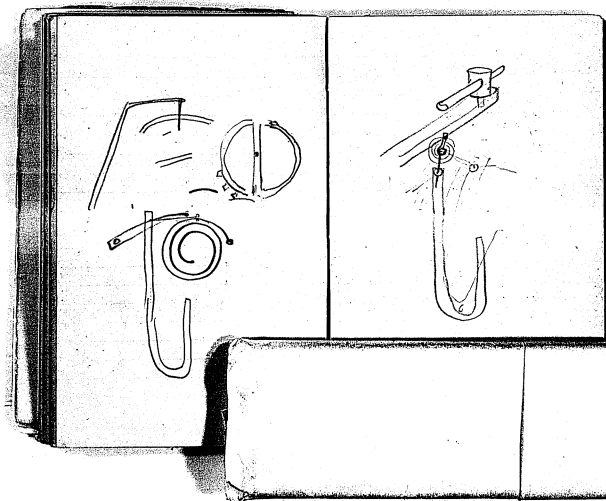


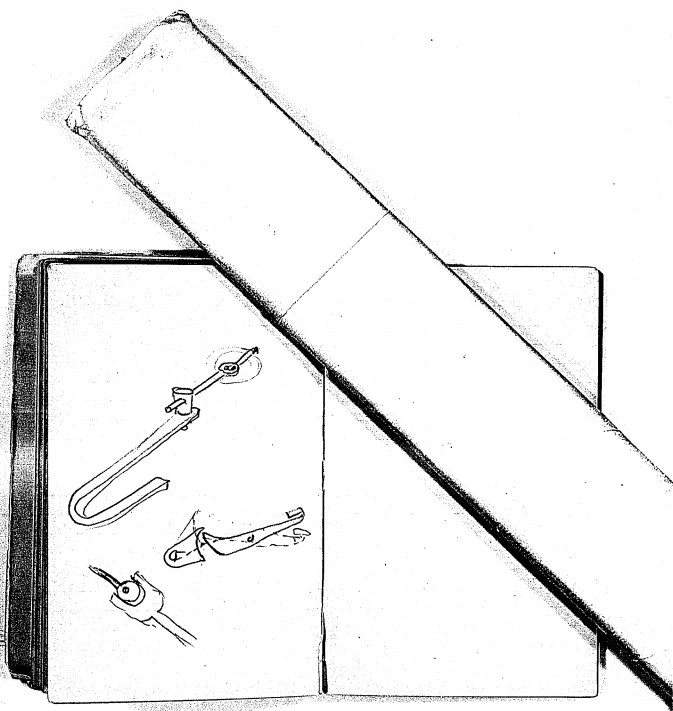
J E Wright

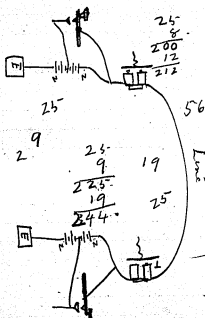


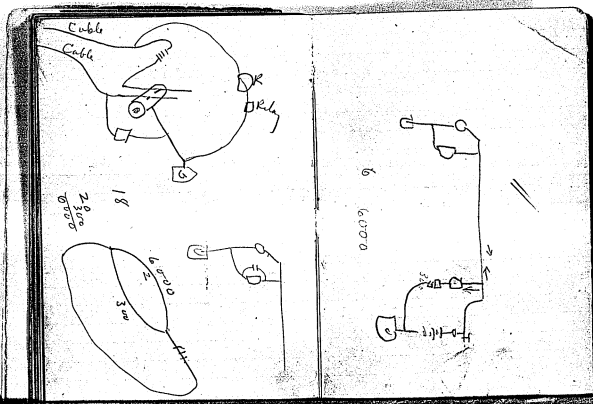


Two



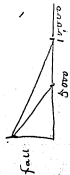






5000 ohms resistance

10,000 ohms resistance



both holding same charge
Equal Electrostatic Capacity

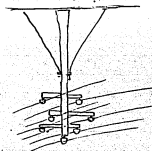
10 1/2

700
350
350

1271

290
6
1746/1254 (4)
59

15 x 20 wires on one short pole



The wires from London to Liverpool are
the best string wires I ever saw.

Pocket Notebook, PN-74-00-00.1

This notebook contains records of chemical experiments for the automatic telegraph, lists of parts, and lists of employees and their hourly rates. The entries are in the hand of Charles Batchelor. The book is undated but probably was begun early in 1873, since three of the workmen mentioned (Watchman, Carver, and Millis) appear in the time books only for March of that year. (See Cat. 1218, Accounts Series.) The cover is marked "Wages Price list." Eighteen pages of this unnumbered book have been used.

Wagon Price list
In Account With

THE SINGER IMPROVED
FAMILY SEWING MACHINE

Can be paid for in small Monthly Installments.

● 181,260 Sold during the year 1871.

NO CANVASSERS EMPLOYED IN THIS CITY.

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No. 766 Broad St. Newark, N. J.

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INMAN LINE
ROYAL MAIL STEAMSHIPS,
FOR PASSAGE
TO AND FROM

LIVERPOOL, QUEENSTOWN,
GLASGOW and LONDON DERRY;
AND STERLING DRAFTS
On ENGLAND, IRELAND and
SCOTLAND.

Apply to **J. WILSON SMYTH,**
STATE AGENT; 744 BROAD ST. NEWARK.

Entered according to Act of Congress in the year 1871, by J. McNally
in the Office of the Librarian of Congress at Washington.

B. McNally, Publisher, 153 and 155 Market St., Newark, N. J.

PN- (74-00-00.1)

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**20 per cent. saved by buying your
TEAS, COFFEES, CHOICE GROCERIES,
Flour & Butter, at
SIMON SCHEUER'S**

Principal Depot, **736** Broad St. cor. Commerce.
Branch Stores, **874** Broad St. **92** Orange St.
Importer of fine Wines, Liquors and Segars, &c.

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FURNITURE, CARPETS, OIL CLOTHS,
Crockery & Glassware,
AND HOUSE FURNISHING GOODS

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ASSORTMENT LARGE. PRICES LOW.
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**THE NEWARK MUTUAL FIRE
INSURANCE COMPANY,**

Office, 741 & 743 BROAD STREET.

Will Insure your House or Furniture, at the lowest
cash price.

JOHN J. HENRY, Sec'y. C. M. WOODRUFF, Pres.

L. W. Little
21 Duvoigt Place
C 10th St N.Y.

G Beebe
Box of C.C. Bradford
90 Madison St

M. Brader
454 West 33rd Street
Bel. 9 & 10 Ave
M Y

cents per hour								
1	J. Dean	30.	X	—	21	Mundig	32½	X
2	Meun	37½	X	—	22	Burroughs	27½ 30.	
3	Webb	32½ 35	X	—	23	H. O'Leary	30	
4	DeBane	30		—	24	Wm. Tappan	16⅔	X
5	Kohler	32½	X	—	25	Wm. " Jun	16⅔	
6	Farrell	40.	X	—	26	Wm. Washburn	10	
7	Holmes	26⅔	X	—	27	Bandman	30	X
8	E. Osborne	21⅔, 23⅔	X	—	28	Mcadee	35	—
9	Boylan	40%	X	—	29	Brad	35	—
10	Gibson	9½	X	—	30	Pfaff	16⅔	
11	Paterman	6⅔, 7½	X	—	31	J. Cochran	8½	
12	Chandler	16⅔	X	—	32	Corrie	22½ 30	X
13	Sheep	25		—	33	Mattindale	13⅔	
14	Wedge	37½	X	—	34	W. Cochran	5	
15	Egan	32½	X	—	35	Hagoman	21⅔	
16	Valentine	30		—	36	Delany	6⅔	
17	Wag	11⅔, 13⅔	X	—	37	Walungo	10	X
18	Schwartz	37½ 30.	X	—	38	Vales	16⅔ 20	X
19	Ridden	6⅔		—	39	Dilling	X. 18½	X
20	Quinlan	18⅔	X	—	40	Ladach	6⅔	

E. Washburne	8½, 10,	-
Salter	4½, 7½	
W. Fleming	7½	
Harrel	10	
Brumgar	10	
A. Smith	6½	
Wardbridge	8½	X
Tierney	8½	
C. Fleming	5, 8½, 5½	X
D. Russell	10-11½	X
W. Smith	7½	
B. Gillan	10	
C. Bird	4½	
J. Bradley	3, 3½	-
C. Fleming	11½, 10½	
O. Kuchinbael	20	
Hal. Haas	3½	
W. Walker	5	
W. Hancock	10	
M. Hancock	10	

	Automatic								
26	Roller pen. Buckle								
1	Water Rheostat								
1	Draw Bush								
1	Friction wheel								
1	full set for another desk								
1	Conn. spg. Gasmeter								
7	Label units								
2	Keys								
1	Friction Wheel								
1	Bush & holder								
2	Gasmeter pen & 2 holders								
6	Stiff Ric pens								
2	Repeater								
4	Tools to repair								

Experiments with —
Fenid-sol. — iron pen

Hydrosulphuric Ac. } white paper.
Cyanuric Potash } with time

deep black mark: but fades ~~out~~

² Fenid Sol. } very light yellow
Hydrosulphuric ac. }

after purple blue mark: very broad

³ Fenid Sol. }
Hydro-sulph Ammonia } white paper

black mark turns brown

⁴ Ferricyanide Sol. }
Chloride Calcium }
Hydrosulphuric Ac. }

Antimonyate Pot } white paper Brown mark with Iron pen
Chloride Sol. S

Antimonyate Pot } white paper
Chloride Sodium } Brown mark
1 drop Hy Sulph. ac.

Blue Chlor

Hydrosulphates of Ammonium

3. ditto more salt.

4. disto disto More Hydro sulphate of Ammonium

8	ditto	ditto	7	ditto	feld. d. Sol
---	-------	-------	---	-------	--------------

6	11	11	1	"	"	"	Excess of Total
---	----	----	---	---	---	---	-----------------

Sulfur

Access of ducts

Ferricyanide Pot;

Hypo-sulphite Soda -

10 "ditto"

more by Tenn.

1		2 Solution			
Solution: -					
Hydrosulphate of Ammonium					
Chloride of Sodium					
Tests	Remarks				
Perm. nit	none				
Silver	none				
Zinc	none				
Copper	Ruddish brown mark forms blackish ^{lower}				
Antimony	White mark fades out.				
Iron	Red mark fades out				
Nickel	Greyish black mark				
Bism	Black mark				
Lead	Whitemark				
Platina	none				

1
Get resistance of Iodine paper
moved 3 in a second + prevent
the Iodine from mauling the
paper. See if the resistance don't
decrease as you increase battery

Hydrophilic of Ammonia, salt, & *Beckton Pot.* Only known as *precip.* from *green*. no marks

see Markt

from pen

BEFORE YOU PURCHASE YOUR BEDDING, EXAMINE THE
PATENT SECTIONAL HAIR MATTRESSES, YOU WILL
 SAVE FROM 10 TO 20 DOLLARS ON EACH ONE. WARRANT-
 ED TO EQUAL THE BEST. MANUFACTURED AT **PACK'S**
 BEDDING WAREHOUSE, NEWARK & RAILROAD AVES.
JERSEY CITY, N. J. FOR SALE AT ALL FURNITURE STORES

S. D. LAUTER'S

PIANO
 FORTE
 WARE-
 ROOMS.



No. 657
 BROAD ST.

• In Style, appearance,
 Military Park.
 NEWARK, N. J.

STEINWAY'S, CAHILLER'S, and other first-class makers' Pianos, Parlor
 Organs and Melodians at less than factory prices for cash, or on
 SMALL MONTHLY PAYMENTS; New and second-hand
 Instruments for rent and repair supplied if purchased.
 Pianos also, tuned and repaired.

DELAWARE & HUDSON CANAL CO.

Office: Newark

Superior Coal.

For Generating Steam
AND FOR ALL DOMESTIC PURPOSES,
 AT WHOLESALE AND RETAIL.

Offices, 418 & 420 EDGEMOORE STREET, foot of Division,
 At Newark & Paterson Depot, & 145 Market St.
 HENRY VAN BERGEN, Agents. NEWARK, N. J.

For We sell Coal at as LOW as any other YARD IN NEWARK. LOWER PRICES than any
 other YARD IN NEWARK.

JAS. MARSHALL & Co.

THE PEOPLES' CLOTHIERS,

809 & 811 BROAD ST.

Opposite Newark Savings Bank. NEWARK, N. J.

Pocket Notebook, PN-73-03-26

This notebook contains notes, drawings, specifications, and price lists for telegraph equipment and component parts. Most of the entries are in the hand of Charles Batchelor. The dated entries are for March and April 1873. Much of the material is related to the manufacture of universal printers and stock tickers. Near the end of the book is a list labeled "Instruments that we lost," with the word "money" immediately above. The front cover is marked "Price Lists." Approximately 30 pages of this unnumbered book have been used.

Price List

In Account With

THE SINGER IMPROVED
FAMILY SEWING MACHINE

Can be paid for in small Monthly Installments

181,260 Sold during the year 1871.

NO CANTASSERS EMPLOYED IN THIS CITY.

LEAVE YOUR ORDERS AT THE OFFICE

No. 766 Broad St. Newark, N. J.

O. T. Hopper & Co. Gen'l Ag'ts.

INMAN LINE

ROYAL MAIL STEAMSHIPS,

For PASSAGE

TO AND FROM

LIVERPOOL, QUEENSTOWN,

GLASGOW and LONDON DERRY,

AND STERLING DRAFTS

On ENGLAND, IRELAND and

SCOTLAND.

Apply to **J. WILSON SMYTH,**

STATE AGENT, 744 BROAD ST. NEWARK.

Registered according to Act of Congress in the year 1871, by H. McNally
in the Office of the Librarian of Congress at Washington
H. McNALLY, Publisher, 153 and 155 Market St., Newark, N. J.

PN-73-03-26

THE WORKINGMANS' SAVINGS BANK.

**20 per cent. saved by buying your
TEAS, COFFEES, CHOICE GROCERIES,
Flour & Butter, at
SIMON SCHEUER'S**

Principal Depot, **736** Broad St. cor. Commerce.
Branch Stores, **874** Broad St. **92** Orange St.
Importer of fine Wines, Liquors and Segars, &c.

A. H. VAN HORN,

DEALER IN

FURNITURE, CARPETS, OIL CLOTHS,

Crockery & Glassware,

AND HOUSE FURNISHING GOODS

Of every description.

ASSORTMENT LARGE-PRICES LOW.

73 MARKET ST., near Court House.

ASSETS,

\$450,000.00

Dividends Every Year

CHARTERED IN 1811.

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C. M. WOODRUFF, Pres.



Price List-	
Stock Printer Parts	
Printing, new Comp.	550
Magnet comp. b/c	320
Star wheel shaft comp.	
Mounted with horn & pin	160
Int. rollers	54-
Mounted type wheel	1150
Shields	12
Paper feed click	40

Relay

Gaining	60
Polishing Port. & Handpicks	22
Assembling Port. for exp.	28
Lumy. rubber	30
Lumy. var. & Bath wash	20
Plating & printing exps.	30
Assembly	18.2

Net 20

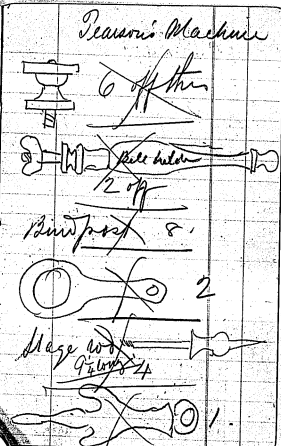
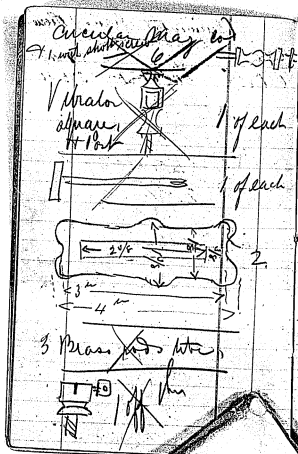
25 Key button	
25 Circuit board diode	
200 Carbons	
Plating for batteries	
Rubber for rounder cones	
Rounder	
Gaining ^{Assembly exp.} 100	40
Lumy. cones & di.	20
Assembly ^{exp.}	15

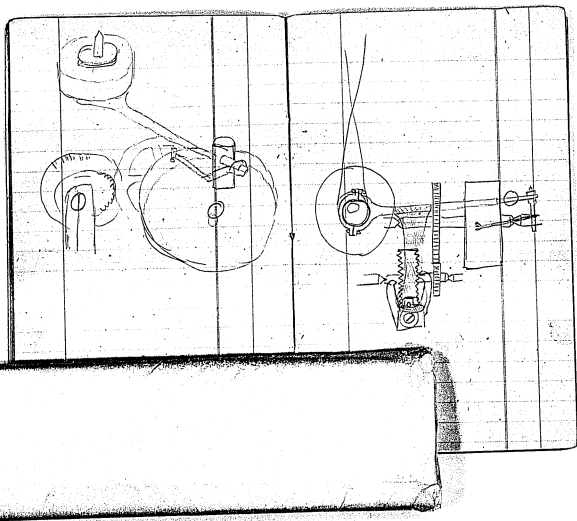
Keys	
Gaining & pol.	40
Water exp. pen di.	12
Assembly	15
	67

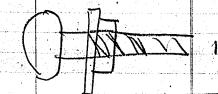
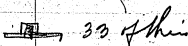
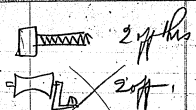
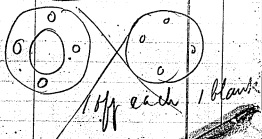
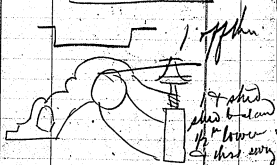
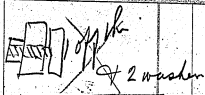
Pupator					
20	20	6.50	60%	37%	22.62
25	23%	5.83	62	33	21.40
38	5 1/2%	14.25	115	32%	15.60
5	1 1/3%	90	62	30	18.60
22	20	4.40	85	20	10.80
56	32%	18.20	5	25	1.25
50	50	25.00	29	32%	9.42
3	30	90	53	31%	17.22
20	5 1/2%	7.51	51	37 1/2	19.13
100	3 1/2%	31.50	30	30	10.50
33%	30	9.75	36	37 1/2	11.26
13	33%	2.75	25	37 1/2	9.34
85	30	29.45	11	20	12.00
50	50	25.00	13	32 1/2	4.22
51.00	50	18.75	10	1 1/2	8.45
31.40	50	12.50	60	32%	19.50
12.50	50	2.00	8	5 1/2%	2.98
32.39	50	2.00	8	5 1/2%	2.98
Pupator		62.67	209.61		
Pupator		22.90			

Experimental Stan. & Recor.

Apr. 6. 1626 1/2 209.61 2160.8 395.90







1 Plate with 2 Cores
 $2\frac{1}{2}$ in. long. $\frac{1}{2}$ in. $\frac{3}{4}$ apart



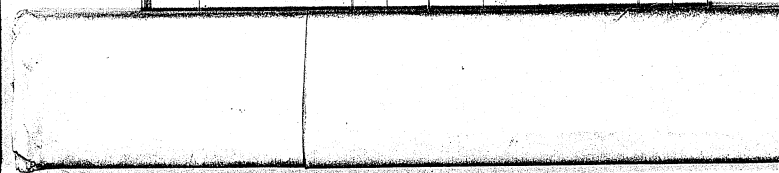
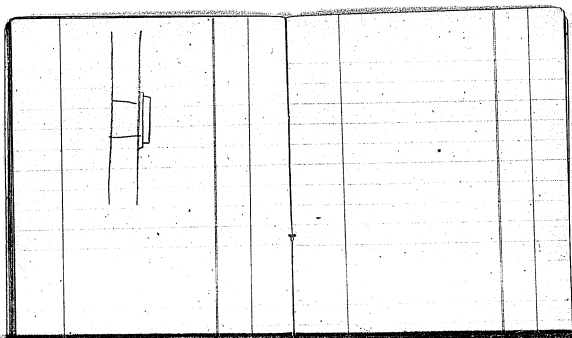
Pearson's Machine

1/2 hr. at 70	100
1 hr. Patch 200	240
Gr. Man. Cost 427	427

Stock & Repair

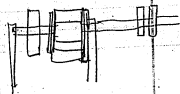
333, 164, 216

697



Bills
 Feb 26 1873

Tables not included
 Feb 26 1873 H. H. H.
 150 Baskets 2 360
 28 6 Hides 18 108
 6 Hugs 6 36
 6 Hounds 6 36
 2 Huffer reamers



11 Lake
 11 Larks
 21 Comp
 24 Relay
 27 H
 9 Rounder
 189 - 25
 162 - 25
 17.05
 Ken

Ken

Cashings
Japan

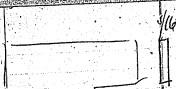
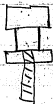
800
200

Transmitter
Plum, & dice base
dice arm
Bulley & shaft
flat spring

Prices

75	Making box		262	50
2600	Winding spool	7¢	182	07
2600	Cans.	5	130	
1300	Reapers	3	39	
400	Cop. cotton wire		880	
400	Print port	15	60	
1300	Press plates	20¢	260	
100	Rubber	7	7	
100	Steel rods	10	10	
			50	
			1886	50

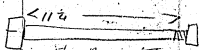
Thickness of wood $\frac{3}{4}$



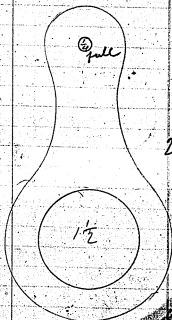
$\frac{1}{16}$ thick



slot $\frac{1}{4} \times \frac{3}{16}$



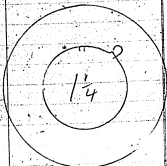
$\frac{3}{16}$ Brass tube
3 off



2 off this

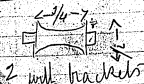
Shunts

1 1/2"	Rubber	350	350
4 1/2"	Copper	60	240
20	Pushposts	18	7



2

4 wires into one
more in other



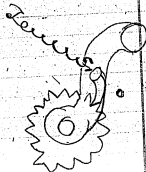
New Universal P.				18 lb. Brass.			
18 lb. Brass cast	61	7	95	25 lb. fl	40	10	00
Pulley rollers.	-	5		263 lb	40	10	52
Engine	-	25		32	40	12	80
Paper guide complete		3	50	39	40	15	60
Brass disk		3	50	Wood			70
Smoking Lever		3					
6 long center screws			90				
Apr 12 25 lb. Latron +	60	15	00				
4 complete Mayner		12					
North			70				
17 263 lb.	60	15	70				
39/20 37 1/2			80				
10, 31 1/2							

Morris
Instrumental that we lost

1. Murray's patent (Camp)
2. First try & test for them
3. Various instruments for W. H. L.
4. Unofficial alterations
5. Paper withering machine
6. Various copies on above engine
7. Moving from other shop.
8. Mould 3 etc. for toy engine
- 9.
10. Gear only, horse
11. Compensating in preparation when
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.
- 18.

Price Work Price

1	1st 1st Printer repair	275
2	Louder & Rep?	
	Drumming etc	150



Motor Co. Dr.
Is Smith st

Aut. del. Co. Dr.
to H. Aut. patent No. 2

96. 00

Lo fund. Relap

Help 10 10

Schwarz 7.

33 x 11 1/4 x 25 1/2

A. D. BALDWIN,
 464 BROAD STREET,
 NEWARK, N. J.
HOUSE FURNISHING
 Furniture for
 Parlor, Hall,
 Dining Room,
 Chamber and
 Kitchen.
 Lamps and
 Chandeliers.
 China, Glass,
 Stone China,
 Paris Granite,
 Plated Ware,
 Cutlery,
 Britannia, Tin, and
 Kitchen Hardware.
 Large Assortment at lowest CASH PRICES (delivered free.)
 SEND FOR CATALOGUE.

H. H. EHRLERS,
 83 MARKET STREET,
 NEWARK.
 Bet. Platts & Washington Sts.



**Choice Goods
 AT
 Low Prices.**

CALL AND SAVE MONEY.
Deutsches Hut Geschäft.

BEFORE YOU PURCHASE YOUR BEDDING, EXAMINE THE
PATENT SECTIONAL HAIR MATTRESSES, YOU WILL
 SAVE FROM 10 TO 20 DOLLARS ON EACH ONE: WARRANT-
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S. D. LAUTER'S 28x16

PIANO
 FORTE
 WARE-
 ROOMS.



No. 657
 BROADST.
 Up Steps, opposite
 Military Park,
 NEWARK, N. J.

STEINWAY'S, GABLE'S, and other first-class military Pianos, Pianos,
 Organs and Melodions at less than factory prices for cash, or on
 SMALL MONTHLY PAYMENTS; New and second-hand
 Instruments to let and rent applied if purchased.

Pianos &c. tuned and repaired.

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 20- We sell Coal at as LOW as any LOWER PRICES than any
 other YARD IN NEWARK.

JAS. MARSHALL & Co.

THE PEOPLES' CLOTHIERS,

809 & 811 BROAD ST.

Opposite Newark Savings Bank. NEWARK, N. J.

Pocket Notebook, PN-73-04-30.1

This notebook contains drawings and price lists of telegraph parts, price lists of batteries and chemicals, and employee time records. Most of the entries are in the hand of Charles Batchelor. The employee time records are dated April 30-May 14. There is an additional entry for Friday, May 23 (probably 1873). The front cover is marked "Price list." Fourteen pages of this unnumbered book have been used.

Price list

In Account With

17. 11. 0

*12 20
1 7 0*

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—For PASSAGE—
TO AND FROM
LIVERPOOL, QUEENSTOWN,
GLASGOW and LONDONDERRY;
AND STERLING DRAFTS
On ENGLAND, IRELAND and
SCOTLAND,

Apply to **J. WILSON SMYTH,**
STATE AGENT; 744 BROAD ST. NEWARK.

Entered according to Act of Congress in the year 1871, by J. B. McNeely,
in the Office of the Librarian of Congress at Washington.
H. MCNEELY, Publisher, 351 and 353 Broad St. Newark, N. J.

THE WORKINGMANS' SAVINGS BANK.

**20 per cent. saved by buying your
TEAS, COFFEES, CHOICE GROCERIES,
Flour & Butter, at
SIMON SCHEUER'S**

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Branch Stores, **874** Broad St. **92** Orange St.

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FURNITURE, CARPETS, OIL CLOTHS,

Crockery & Glassware,

AND HOUSE FURNISHING GOODS

Of every description.

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73 MARKET ST., - near Court House.



ASSETS,

\$450,000.00

Dividends Every Year

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C. M. WOODRUFF, Pres't.

Price list of Parts of Relay

Relay	18
Sounder	6 50
Key	5 50
Small Morse	6
Registers	45





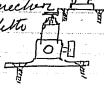
Bindposts		per 100 each
No 1 size Instrument		1800 180
3 size small		1300 14
No 1 size with screw		1800 200
Double Connection		1330 25

Table Connector
Double disto



Office fixtures
Message Hook



per day

75

Battery Carbon No 1

Carbon Battery No 1 1/2

Per
100 each

Carbon ——— 40.00 50

Carbon clamp. 18.00 20

Carbon Connection 25.00 30

Porous Cup. (Cada 1/2 doz) 14

Glass Jars (Each 4.00) 37

Zinc puds 6.50 ~~4.00~~ 68

Complete Cup. per doz 22.00 2.00

Length	Machine	Screws	per 100
$\frac{1}{4}$	94	100	
$\frac{1}{8}$	94	170	100
$\frac{1}{2}$	94	100	100
$\frac{5}{8}$	100	100	
$\frac{3}{4}$	100	120	
$\frac{7}{8}$	115	100	
1	123	130	
$1\frac{1}{4}$	160		
$1\frac{1}{2}$	150		

30 Apr May 7-14

Wm 185, = all.
40-Record Inst

Mensi - 50 Primes. }
36 hr 59. 60. }

Praden, 26. 04. 57.
Heise (153) Aus. 100 Endue

Shwartz 110 hr altogether
27.6 hr awake

63	30	30
48	—	160
55	—	

Page III -
3 day or 2 day.

Quintan, 180,

May 60. 60, 60, - (70)

• The first set of 81 (London
Pillars 2) (London)

January 60 60 62. / 10

2000 Post 30 - (Index)

ED 180, (120 Induc) #211
CF 180-70 80 76. #211

$$\begin{array}{r} 57 \\ 3 \overline{) 171} \\ \underline{15} \\ 21 \end{array}$$

$$\begin{array}{r} 170 \\ 5 \overline{) 850} \\ \underline{34} \\ 510 \end{array}$$

$$\begin{array}{r} 70 \\ 7 \overline{) 490} \\ \underline{21} \\ 280 \end{array}$$

$$\begin{array}{r} 191 \\ 19 \overline{) 361} \\ \underline{17} \\ 191 \end{array}$$

$$\begin{array}{r} 362 \\ 36 \overline{) 1296} \\ \underline{25} \\ 1046 \end{array}$$

Indus Cell Record
Wash. 24.00 - 20.00

Krensi.	9.75	3.25
Hebe	25	23.25
Schwach	6.75	

$\begin{array}{r} 9.75 \\ 6 \\ 9 \end{array}$

141 1350
155 4 65 6 6
2130 616 2.00 106 1/2 90

Handwritten calculations and numbers:

Top left:
$$\begin{array}{r} 36 \\ 46 \\ \hline 82 \end{array}$$

Top middle: 9

Top right:
$$\begin{array}{r} 39 \\ 49 \\ \hline 88 \end{array}$$

Bottom left:
$$\begin{array}{r} 32 \\ 42 \\ \hline 74 \end{array}$$

Bottom middle: 6

Bottom right:
$$\begin{array}{r} 34 \\ 44 \\ \hline 78 \end{array}$$

$\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$\frac{10.4}{8.4} \div \frac{2.3}{1.2} = \frac{10.4}{8.4} \times \frac{1.2}{2.3} = \frac{10.4 \times 1.2}{8.4 \times 2.3} = \frac{12.48}{19.32} = 0.646$

10/1/5 $\frac{810}{548.0}$
132.27

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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West end study

May 23 (1873)
N.H.S.

~~Went 60.~~

~~Went 24 hr~~ 20 Franken

Köhler

~~Went 50 hr~~ Cellulose

~~Went 39 hr~~ 20 hr 20 hr 20 hr

~~Went 20 hr~~ 20 hr 20 hr 20 hr

Went 60 hr

(20 hr)

Garten

~~Went 60~~

~~Went 60~~

Pollen 70

Pollen 60

Pollen 60

Pollen 60

Pollen 60

Pollen 60

20 Ent. cells.

20 Ent. cells + Escapement

action

Mrs. Fudge	20	4	00	Klein	57	50	
Hedge	39	11	75	Kohler	125	-60	
Cliff	25	1	80	Marty	54	-	55
	61	7	50	Madley	49	-	50
Pilling	35	2	85	Healy	55	-	30
Robson	50	11	50	McDonnell	55	-	30
Pied	60	3		Conroy	60	-	55
Gulay	50	8		McDonnell	45	-	60
Walsh	50	5		St.	60	-	60
		49	43	Frank Gray	60	-	20
				Pillay	42	-	70
				St.	12	-	60
				Conroy	60	-	60
				Dulay	55	-	60
				Walsh	12	-	60
				Marshall	60	-	19
				Fleming	60	-	74
				St.	135	-	70
				Rudolph	42	-	Greenwood

Drugs.
 Sulphuric Acid per lb. 0.4
 Salicylic Acid per lb. 0.8
 Blue Vitriol
 Bichromate Potash
 Platina per unit 45

1.35 144
 144 135 100
 144 135 100 144
 1296
 840

165 144 100
 115 144 100
 115 144 100
 115 144 100

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 Furniture for China, Glass,
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 Chamber and Plated Ware,
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BEFORE YOU PURCHASE YOUR BEDDING, EXAMINE THE
PATENT SECTIONAL HAIR MATTRESSES, YOU WILL
 SAVE FROM 10 TO 20 DOLLARS ON EACH ONE: WARRANT-
 ED TO EQUAL THE BEST. MANUFACTURED AT **PACK'S**
 BEDDING WAREHOUSE, NEWARK & RAILROAD AVES.
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 FORTÉ
 WARE-
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STEINWAY'S, GABLE'S, and other first-class makers' Pianos, Etc.
 Organs and Melodians at less than factory prices for cash, or on
 SMALL MONTHLY PAYMENTS; New and second-hand
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For Generating Steam.

AND FOR ALL DOMESTIC PURPOSES,
 AT WHOLESALE AND RETAIL.

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HENRY VAN DERGREN, Agent. NEWARK, N. J.

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 other YARD IN NEWARK.

JAS. MARSHALL & Co.

THE PEOPLES' CLOTHIERS,

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Bank. NEWARK, N. J.

Pocket Notebook, PN-73-04-30

This notebook contains notes and drawings on telegraph and battery experiments. All are by Charles Batchelor except for one page by Edison. The first page is dated Sunday, September 7 (probably 1873); the only other dated entry is for March 18. On the last page is a description, signed by Batchelor, of a visit by an unnamed person. The front cover is marked "Experiments" in ink, with "Batch" written in pencil underneath. Thirteen pages of this unnumbered book have been used.

Continued
In Account with
Ball

Rutsey, Hunter & Rutsey,
Fabrikanten und Verkäufer
von fertigen

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garantirt oder das
Geld
zurückgegeben.

A. J. Mount,
der Ein-Preis Hutmacher,
Ede Market und Mulberry Streets,
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Da ich nur geringe Un-
kosten habe, so kann ich Gutes
und Rapen von
25 bis 50 Cents
(an jedem Hutfel) unter dem
Verordnungs-Preise verkan-
ten. — Die neuesten Facen
sind vorrätig.

Deutsche Sparbank.

7 pM. Juhlen vom Tage der Eingebung.
Geld Wechsel- und Paffage-Geschäft.
Essentialisches Notariat.
Feuer- und Lebens-Versicherung.
Fredt. J. D. Kumpf,
21. Market Street,
Newark, N. J.

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Samuel F. Davis, Wall Papers, White & Buff Shades
and Ho. n. n. 75, 583 Broad St., Newark, N. J.

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Watches, Clocks, and Jewelry
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 719 Broad Street.

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Ernstes Orgel.

Ernstes Orgel.

Ernstes Orgel.

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 Miete und mündlicher Bedingung, oder für die niedrigsten Barpreise.
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G. W. Woodruff,
 Präsident.

John J. Henry,
 Sekretär.

PN- (73) - 04-30

Up 7 Sunday

Made Ferrid cyanide of Potash

10. Ferricyanide of Potash
 3% Water ... dissolves

Mix 1 part of black oxide
 Manganese with 2 parts
 of strong Hydrochloric acid
 in glass retort & subject
 to gentle heat. Cyanogen
 Chlorine gas will be
 released which may be
 passed through the above
 solution till it becomes
 of a reddish green color
 & will not give a blue
 precipitate with a
 perfluoride of Iron

Experiments



2 Natuna plates + water
 test deflection through minor
 further test

plates		friction	constant
Natuna plates 2' apart	6	6	$\frac{3}{4}$
" " 6' apart	5 $\frac{1}{2}$		
12 "	5		
18 "	4		

Exp 181



Distance of scale from Mirror

Distance of Plate from cable

Length of cable

Resistance of wire 113 ohms

Resistance of Galvan 2100 ohms

Constant 6

- 105 Small cups

Z to Cable

Time	Further deflection	Time back	Start time
15 sec.	12	30 sec	3.3
20 sec	2	36	3.5
40 sec	2 1/2	35	3.7
90 sec	2 3/4	40	3.9
90 sec	2 3/4	50	3.14
180 sec	3 1/8	40 sec.	3.17

here I rolled 1 degree to right back
I came to 1/2 sec when I started
I put ~~back~~ into cable

try again T as a zero by magnet

180 sec.	2	30	3.23
180 sec.	2	30	3.27
It deflects a degree to right side			
when I pull battery through cable			
180 sec	2 1/4	25	3.42
20 sec	2 1/2		3.58

over

Length of Sec.	degrees	time taken	time
30 sec	2 1/2	38	4:00
when I close key it moves half a degree in opposite direction			

90	3	30	4:15
It seems to get in on electric start which runs from the cable + there being a battery			

Copper to Cable

10 sec.	clearly	4:0
30 sec.	very bright	4:9
300 sec.	1/2 deg.	4:14

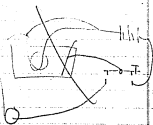
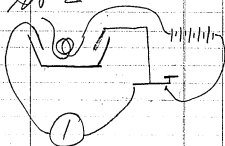
Time to Cable

30 sec	1	20	4:23
60 sec	1 1/2	31	4:24
80 sec	2 1/2		4:40
Copper to Cable			
20 sec	1/2		4:50
60 sec	about same		4:57

Start with 2100 Shunt
to get greater deflection
2nd cable
see def. uncorrected

Line
435

W 2



constant 24 mag. in
Time h Cable def. h left

10 sec	3½	30	5.5
20 sec	5	35	5.6
60	6	40	5.74
120	6	40	5.9

Oppen & Cable. right

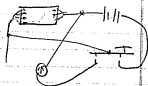
10 sec	4	30	5.26
20	2	25	5.28
60	2	25	5.31
120	2	25	5.33

Time & Cable

10	4	35
20	5	35
60	5	35
120	5	35

Try 1 Carb battery on
Large secondary rate
deflection every few
minutes. To Row

Try Condenser with
the 2 boxes of
batteries. Same as used on
Cable -



Small batteries
for testing purposes.

March 18. Noon

No.	1	2	3	4
1				
2	49 $\frac{1}{2}$	26	6 $\frac{1}{2}$	$\frac{1}{2}$
3	50	28	7	$\frac{1}{2}$
4	52	16		
5	51 $\frac{1}{2}$	28 $\frac{1}{2}$	9	1
6				

$$\begin{array}{r} 268 \\ 965 \\ \hline 1280 \\ 1544 \\ \hline 300 \\ 1844 \\ 271496 \\ 225370 \\ \hline 330826 \\ 2670 \\ \hline 500 \end{array}$$

[illegible]

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Window Glass, White Lead, French
Zinc, Paris White, Whiting,
White Glue, Linseed Oil,
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Lard Oil, Burnt Umber, Metallic
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and Chimnies, Varnish, and
many other articles in
our line

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216 MARKET STREET, Newark, N. J.

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General Hardware.

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STEAM AND GAS PIPE AND FITTINGS,

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No. 190 MARKET ST., NEWARK, N. J.

Pocket Notebook, PN-73-11-27

This notebook contains records of chemical experiments (some executed, some only proposed) relating to automatic telegraphy and batteries. The cover is marked "Experiments made by Chas. Batchelor" and the entries are in his hand. The only entry with a complete date is for November 27, 1873. Two loose leaves by Edison and Batchelor, written on the back of American Telegraph Works notepaper, have been inserted into the notebook. They contain notes on chemical experiments. Approximately 20 pages of this unnumbered book have been used.

Experiments

In Account With

Chas. Batchelor

THE SINGER IMPROVED
FAMILY SEWING MACHINE

Can be paid for in small Monthly Installments.

181,260 Sold during the year 1871.

NO CANVASSERS EMPLOYED IN THIS CITY.

SO LEAVE YOUR ORDERS AT THE OFFICE,

No. 766 Broad St. Newark, N. J.

O. T. Hopper & Co. Gen'l Ag'ts.

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ROYAL MAIL STEAMSHIPS,

—For PASSAGE—

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GLASGOW and LONDON DERRY;

AND STERLING DRAFTS.

**On ENGLAND, IRELAND and
SCOTLAND,**

Apply to J. WILSON SMYTH,

STATE AGENT; 744 BROAD ST. NEWARK.

Entered according to Act of Congress in the year 1871, by H. McNally
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H. McNALLY, Publisher, 153 and 155 Market St., Newark, N. J.

PN-73-41-27

THE WORKINGMANS' SAVINGS BANK.

**20 per cent. saved by buying your
TEAS, COFFEES, CHOICE GROCERIES,
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**FURNITURE, CARPETS, OIL CLOTHS,
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Of every description,
ASSORTMENT LARGE PRICES LOW.
73 MARKET ST., near Court House.



ASSETS,

\$450,000.00

Dividends Every Year.

CHARTERED IN 1811.

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Office, 741 & 743 BROAD STREET,
Will insure your House or Furniture, at the lowest
cash price.
JOHN J. HENRY, Sec'y. C. M. WOODBUFF, Pres.

Experiments. Copying

1. *Write a set of letters on some
Fancy paper.*

*Substitute some cheap
paper and the Engr.
Write a message using the
letters O x as an init. & copy
onto the Fancy paper.*

Result: failure

2. *Write a message.*

Result: failure

3. Shiny solid of Nitrate of Cobalt
write with, & damp sheet
with weak solution of Amal.
ac. (No. 1000)
Result

4. Write with Shiny Nit. Sol.
copy on damp paper & expose
to sunlight
Result.

5. Write with decol. Gall.
damp paper as sol. of
Chlor. Antimony (yellow copy)
Result

6. Write with solution of
Chlor. Oxide or Chl. Nickel
damp sheet & copy, apply
heat & copy into thin
green.
Result.

7. Write with sulphide of
Potassium & damp sheet
with Acetate of Lead.
Result

Write with Alkanet root
(Anchusa tinctoria)
damp with sulphuric acid
spreads crimson etc in few
red tinge.
Result:—

Write with strong sol of osm
of the chro. Pot. & damp paper
in water (halfpale.)

Write with Buckland's Iron
& damp paper with Tannin or
or Gallie. etc. In K. black etc

Write with strong sulphuric acid
& damp paper with a chlorate
Red color.

Any writing with a protosol of iron
& dampen with red, etc.

Write with line of lacquer
& damp paper in halfpale.

Nov. 27. 5 p.m. Gravity

New Battery Sulfate Bron
bottom
Bron plate
1 1/2 inches above

Just made defect

	1	2	3	4	
	3 3/4	3 1/2	6 1/2	1/2	Line 2 ft under
16 hr	10	8	1/2	1/2	above
Nov 28 10 p.m.	10	9	1/2	1/2	x 2 ft Sulph Line added

Make 2 half water keeners

- 1 Copper & Zinc
- 2 Zinc & Carbon
- 3 Carbon & Iron

Batteries	Low in Place of Low	Nov 24. 1873.	15
No Batteries	Under	Low	1 2 3 4
			Battery

Mr. Rutledge	Secede	Lead	Lima.

1. 2. 3. 4. *unio*

Lupinus albus var. *albus* 68 NY 66 18% Justified Nov 27

1. 1/2 @ 2. 10:01 PM 28.

[illegible]

Barley 16

Outside	Inside	Time	Date	Leaf
81	high	10 PM	Nov 25	8
11	after	Nov 25	8	19
				th. 20. night

"No after" proved this a perfect failure

Experiment

Run a taper in clean narrow
neck bottle - taper goes out -
cause formation of Carbonic acid gas from
the carbon contained in wood & water
Test. Pour a little lime water in
the bottle & it becomes milky - formation
of Carbonate of lime

Put some flowers of sulphur in a
glass flask & above it height
of pure turpentine - over a spirit lamp
the sulphur melts & gets darker
in colour & looks coffee brown
turns.

Get an old bottle without bottom
put in a basin of water under
which float a piece of burning phosphorus
after a while it goes out & you find
more water in the jar the phosphorus
burns the O in the air leaving the N
in the jar which will put out a taper

Bleach out the air from your
lungs through clear lime water
it will become milky due to
the formation of chalk or
Calc. lime from the

Experiment

Dissolve Nitrogen acid in water
in conc. Sulph. ac. with heat
an uncolored fluid is obtained
Place a little of this double acid in
a porcelain dish, heat till it begins
to throw off white vapor, add a
certain quantity of absolute alcohol,
a beautiful blue color is if by orange
is formed.

Solubious Mass

1. Nitrate of Copper ^{Made}
Copper filings
Nitric acid. dil.
Blue color. set aside
to crystallize

2. Azemate of Ammonia
Concent. sol. Arsenic ac.
saturated with Amm. or
carb. ammonia
set aside to crystallize
white substance

3. Phosphate of Ammonia
Phosphoric Acid. concent. sol.
Carbonat. Am. & saturated
set aside

5 Carbonate of Zinc
 1 lb. Sulph. Zinc
 1 lb. Carb. Zinc
 1/2 pt. Hot water

6 Ammoniated Copper

Sulph. Copper 1/4 lb.

Carb. Amm. 3 drachms

Rub them together in glass

mortar

wrap in blotting paper

& dry with gentle heat

it be kept in glass stopper

bottle
 turns a beautiful purple
 colour.

7 Nitrate of Iron (Pharmoc)

Iron wire 1/2 oz. Pure.

Nitric Ac 1 p. 142 1/2 F. & B.

Ind. ac 1 pint water

add Iron 1 drach at a time

agitate

allow to dissolve

filter sol. till gas ceases.

heat to 160 F.

Drop in Nitric Ac

the compound

until it acquire

bright red col.

& heated with Ammonia

a red precip. with or

any tinge of black

add enough water

measure of 15 F. & B.

Tharman, D. 682

8 Nitrate of Lead

distilled lead $2\frac{1}{4}$ oz. 1 lb or

$\frac{1}{4}$ Pint Nit. Ac. Imp. measure

dissolve tharman in oil

with gentle heat

filter & set aside to crystal.

Concentrate the residual

liquid to get more

crystals

Sinking sheet			To one with date	
the				
1	5.	—	5	
2	10.	—	11	
3	18	—	19	
4	19	—	20	
5	49		50	
6	190		105	
7	200		215	
8	490		500	
9	995		1009	
10				
11				

Bergman's time $\frac{20}{5.5}$
 20th time $\frac{20}{5.5}$

Dec 19 Due Batch 432.14

Kohler Standard 100 L

Debam's Base 50 L

Quaker No. 1 60 L

Edison - No 1 -

Exide of Potassium

No 2 Sulphate of Magnesium

Latex Chloride of Cu

782 1138 797

1136 859 789

559 1008 80

405 1128 410

300 1148 507

496 387 1055

796 1020 771

537 1064

416

A. D. BALDWIN, 10 10 35

464 BROAD STREET.

NEWARK, NEAR M. & E. R. R. DEPOT.

HOUSE FURNISHING

Furniture for G China, Glass,

Parlor, Hall, O Stone China,

Dining Room, P Paris Granite,

Chamber and K Plated Ware,

Kitchen. O Outlry,

Lamps and S Brittania, Tin, and

Chandeliers. S Kitchen Hardware.

Large Assortment at lowest CASH PRICES (delivered free.)

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83 MARKET STREET, NEWARK.

Det. Place & Washington Sts.

NEWARK.



CHOICE GOODS
AT
LOW PRICES.

CALL AND SAVE MONEY.

Deutsches Haus Geschäft.

Carb Zinc

1 oz Sulphur Zinc

1 oz Carb Soda

1/2 pint Water boiling

Take a portion of water

mix Sul 2 & Carb 5

separate then put

together in remainder

in the after set.

aside for powder to

subside. when subsided

pour off liquid wash

precip with hot water

till tasteless then dry

Pharm P 1350

Sulphate of Copper to
Carb Am. 3 drachms
rub them together in glass
mortar

wrap in filter paper
& dry with gentle heat
& kept in glass stopper
bottle

Ammoniated Copper

Page 995

[ITEM FOUND IN BOOK]

BEFORE YOU PURCHASE YOUR BEDDING, EXAMINE THE
PATENT SECTIONAL HAIR MATTRESSES, YOU WILL
 SAVE FROM 10 TO 20 DOLLARS ON EACH ONE. WARRANT-
 ED TO EQUAL THE BEST. MANUFACTURED AT **PACK'S**
 BEDDING WAREHOUSE, NEWARK & RAILROAD AVES.
JERSEY CITY, N. J. FOR SALE AT ALL FURNITURE STORES

S. D. LAUTER'S

PIANO
 FORTE
 WARE-
 ROOMS.



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Opposite
 Milney Park,
 NEWARK, N. J.

STEINWAY'S, GABLE'S, and other first class makers' Pianos, Parlor
 Organs and Melodians at less than factory prices for cash, or on
 SMALL MONTHLY PAYMENTS; *New and second-hand*
 Instruments in lot and sent applied if purchased.
Pianos for repair and renovation.

DELAWARE & HUDSON CANAL CO.
 OFFER THEIR

Superior Coal.

For Generating Steam,
 AND FOR ALL DOMESTIC PURPOSES,
 AT WHOLESALE AND RETAIL.

Offices, 418 ODGEN STREET, foot of Division,
 At Newark & Paterson Depot, & 155 Market St.
 HENRY VAN BUREN, AGENT. NEWARK, N. J.

We sell Coal at as **LOW** if not **LOWER PRICES** than any
 other YARD in NEWARK.

JAS. MARSHALL & Co.

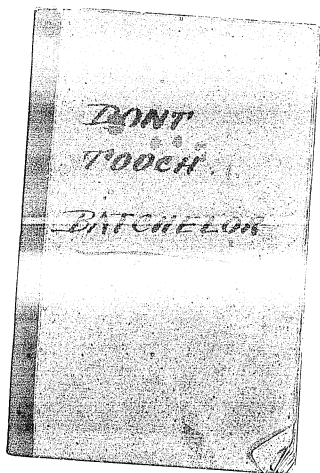
THE PEOPLES' CLOTHIERS,

809 & 811 BROAD ST.

Opposite Newark Savings Bank. **NEWARK, N. J.**

Pocket Notebook, PN-74-01-20

This notebook contains details of chemical experiments relating to batteries. The cover is marked "DONT TOUCH BATCHELOR" and most of the entries are in his hand. The book also contains a list of "Finished work" and a list of piecework done by various workmen. The year is probably 1875, since the entry for employee Kraft for May 20 corresponds with that in Kraft's 1875 time book, PN-75-01-08, Accounts Series. Approximately 20 pages of this unnumbered book have been used.



Estimated work
Jan 20 - 1890 - 2 switches
at a place on R.R.

20. *Glennia* 4 *Spindelia*
21. *Spindelia* 4 *Glennia*

15 *11/20/2012*

10. *S. Linnaea*

21. Two sets of 24.

22. *Phlox* 3' Elv. 1
1. 2. 3. 4. 5. 6.

21	27	Hot / ...
	28	Better ...

23 4 Reeds No 5, 6, 7, 8.

11	25	184 - 1000 real rings
----	----	-----------------------

5 brackets for hanging
each

25

~~25 Copying Blocks~~
~~hatched~~

11

~~5 Copying BB~~
~~clo. 6, 7, 8, 9, 10.~~~~12 Recurring Pens~~~~14 Sounders~~

Feb 17 679 Dotting corrections

Domestic Boxes

2	3	4	5	6	11
72	73	74	75	76	21
22	23	24	25	26	31
32	33	34	35	36	
41	42	43	44	45	
46	51	52	53	54	
55	61	62	63	64	
111	112	113	114		
115	116	121	122		
123	124	125	126		
131	132	133	134		

135	136	141	
142	143	144	
145	151	152	153
154	161	162	163
211	212	213	214
215	216	221	222
223	224	225	226
231	232	233	234
235	241	242	243
244	245	252	253

261	262	311	312
313	314	315	316
321	322	323	324
325	331	332	333
334	341	342	343
351	352	353	361
411	412	413	414
415	421	422	423
424	431	432	433
441	442	451	511
512	513	514	521
522	523	531	532

May 20 Piece Work
and other jobs

Knetzer

4 Keys for \$1.25

14 Keys for 50 cts

Blasien

20 hours at Key

26 Key Lins

Petter

60 hours shop work

Schwartz

5 hours Laundries
and paper wetter at
\$16.00
Gliser

6 Condensers
at \$4.00 a piece

Kraft

30 hours Domestic

Schwartz

4 Plug switches
at \$1.25 each

3 Domestic switches
at \$3 each

and Key \$2 1/2

24 hours shaft work

~~19 hours shaft work~~
~~at \$1.25 each~~

Waltzinger

48 binding parts
at 2 to each 50 hours

able
one really $3\frac{1}{2}$

~~att~~
59 hours

No 1 Budget

Common battery

No 1 Z G1 Right Left
C 85 difference 24 P

a Piece of pure Cu

Z G2 Left 23 P
C 85

a Piece Cadmium

Z G1
C 85 24 P

an " ref side as well

Z G1 24 P
C 85

Cadmium - P + Cu + Plat
L N

Z G1
C 85 24 P

2 Plat beads L N side for
solution

Thyrol. No 1 X.

Galate Mure.

Z 30
C 16 4 N

Water

Z 26 2 N
C 24

Potassium

Z 0
C 0

Rhodium

Z 45
C 50 35 P

Indium

Z 57
C 80 23 P

Mercury

Z 57
C 80 23 P

Magnesium

Z
C No Current

Beryll

Z 0 no current through

C 0

Z 50 20 P

C 50

Ferrum hydrox

0 0 0

Sydenium

Z

C

Ethrum

0 0

Mobium Cerium

0 0

Barium

Barium

Z 57

C 80

23 P

Silver

Z 57

C 80

23 P

Telbium

Z 0

C 0

Tellurium

Z 57

C 80

23 P

Magnesium

Z 57

C 80

23 P

Palladium

Z 57

C 80

Antimony

Z 57

C 80

23 P

I have put on 10 cells.

Platina - current
 Z 75
 C 100 — 25 P.

Ruthenium
 Z 75
 C 10 — 25 P

Cobalt
 Z 75
 C 100 — 25 P

Rubidium could not take
 I taken fire but think it
 is in

Arsenic
 Z 75
 C 10 — 25 P

Selenium
 could get no deflection

Tallium
 Z 75 }
 C 100 — 25 P

Lead
 Z 75
 C 100 — 25 P

Iridium
 Z 75
 C 100 — 25 P

Chromium for
 wire —

Iridium fus.
 Z 75
 C 100 — 25 P

Gold
 Z 75 C 100 — 25 P

Zinc
 Z 75 C 100 — 25 P

Acetate of Ammonia
Z 73 Cl 100 - 27 P
Strong effervescence at
positive electrode + small
if gas large quantities of
gas from both poles

Carbazoic Acid

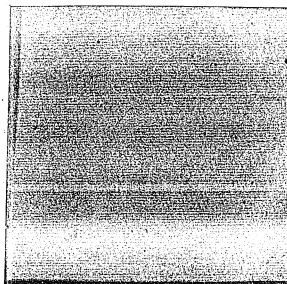
Z 73
C 99 26 P

Red color at N Electrode
lots of gas.

Richmond Inst.
Shel.

228	315
224	313
322	235
314	234
316	251
321	243
244	262
312	161
232	241
233	
253	
226	

185
153



Pocket Notebook, PN-72-00-00

This undated notebook contains notes and drawings relating to telegraph printers. There are drawings by Charles Batchelor of component parts and lists of hours worked by employees on specific components. Approximately 30 pages of this unnumbered book have been used.

In Accord With

THE SINGER IMPROVED
FAMILY SEWING MACHINE

Can be paid for in small Monthly Installments.

181,260 Sold during the year 1871.

NO CANVASSERS EMPLOYED IN THIS CITY.

DO LEAVE YOUR ORDERS AT THE OFFICE,

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ROYAL MAIL STEAMSHIPS,

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TO AND FROM

LIVERPOOL, QUEENSTOWN,

GLASGOW and LONDONERRY;

AND STERLING DRAFTS

**On ENGLAND, IRELAND and
SCOTLAND.**

Apply to J. WILSON SMYTH,

STATE AGENT: 744 BROAD ST. NEWARK.

Entered acc. to Act of Congress in the year 1871, by H. McNally
in the Office of the Librarian of Congress at Washington.
H. McNALLY, Publisher, 153 and 155 Market St., Newark, N. J.

PN-(72-00-00)

THE WORKINGMAN'S SAVINGS BANK.

**20 per cent. saved by buying your
TEAS, COFFEES, CHOICE GROCERIES,
Flour & Butter, at
SIMON SCHUEFER'S**

Principal Depot, **735** Broad St. cor. Commerce.
Branch Stores, **874** Broad St. **92** Orange St.
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Crockery & Glassware,

AND HOUSE FURNISHING GOODS

Of every description.

ASSORTMENT LARGE-PRICES LOW.

73 MARKET ST., near Court House.



ASSETS,

\$450,000.00

Dividends Every Year.

CHARTERED IN 1811.

**THE NEWARK MUTUAL FIRE
INSURANCE COMPANY,**

Office, 741 & 743 BROAD STREET,

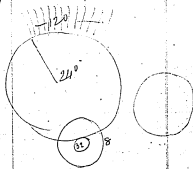
Will Insure your House or Furniture, at the lowest
cash price.

JOHN J. HENRY, Sec'y.

C. M. WOODRUFF, Pres.

Register

Baylan 56"
Linden 10 1/2"
M^o Kay 25" Roller shaft 4.5m shaft
Baylan 5" "
Shawley 10" shaft center
Chowin in 24" ~~center closer~~
Hd mach

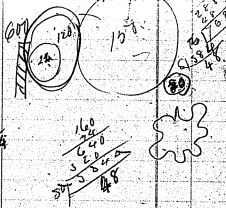


Relays

Sadden	156	stuck for center
Boylan	2nd p. seen at 25	
Bolin	9	set on west
Chadler	6	drill holes
Salvin	21	Shill mod. brass
Ridda	50	Small center shaver
Yamh	10	set on west
Dean	63	at. mine

Louise

New boy	12	DD
Bolin	7	set on west
Smith	12	Drill Brass
Larkin	11	Drill Wood 13
Pilley	11	Drill wooden 20
Salvin	10	set on west
Parish	10	set on west
Dean	21	set on west

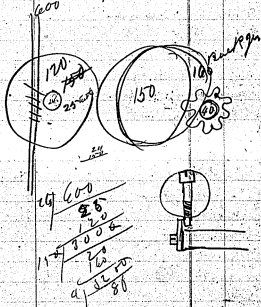


Keys.

Boylan 2 1/2 days long screws.
 Chandler 7 curved close shod
 Boylan Key H². 7 1/2
 " small screw H² 10.
 Day collar for big screw 10.
 Chandler shaft 1/8
 " roller 10
 Mr. Key rollers 5
 " provide screw 10
 Boylan key screw H² 15
 " small screw 5
 Boylan roller screw H² 11
 " roller 10
 Boylan 50 curved screws
 Mr. Key 10. 1 " anti
 Suter 11 Key H².
 Day 20 roller screw
 Suter 8 roller screws
 Suter 120 H². lot mach

Small Horse

2/2 1/4

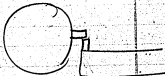
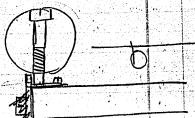


Stock Printer

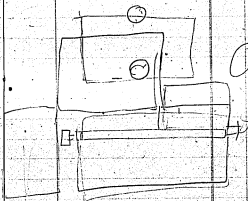
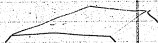
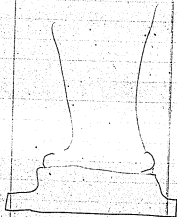
Boylan paper guide steel 15
 Churish paper feed clock steel 7
 Boylan Norm 15
 • Pad screw 15
 P. Bell. 25 set mech
 Kiedler 50 Jam nut
 Sibara 105 h. Ass et
 Alaboni 120 h. for
 Henny 15. Rubber.
 Palmer 115. Pad screw et
 Hellen 45 Ass P.
 Gallen 75 Ass P.
 Gafp 1/10.
 • Jam 166
 Mach. 140
 Dechen

Carbon

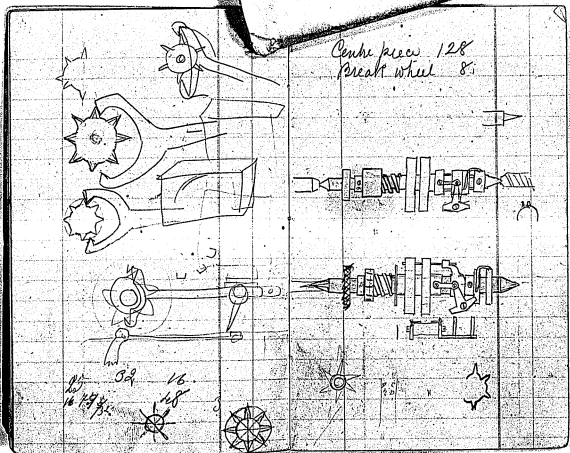
Mc Kay Rease 15



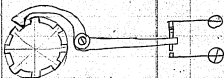
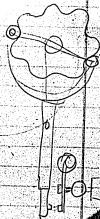
12 Key switch handles
12 Key buttons



06

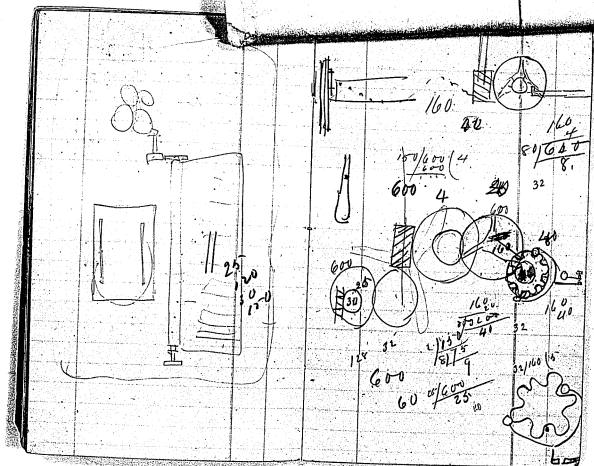


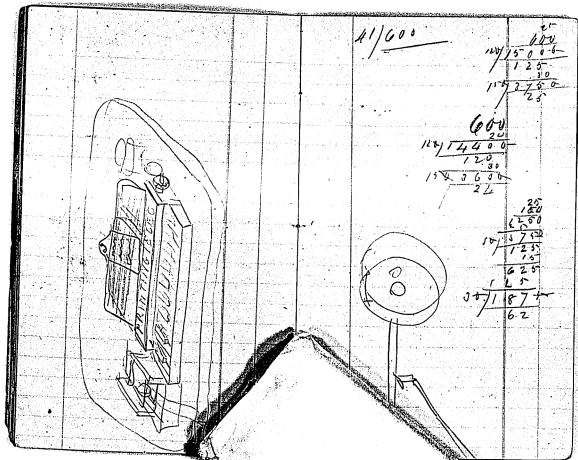
Type Wheels



NO







41/600

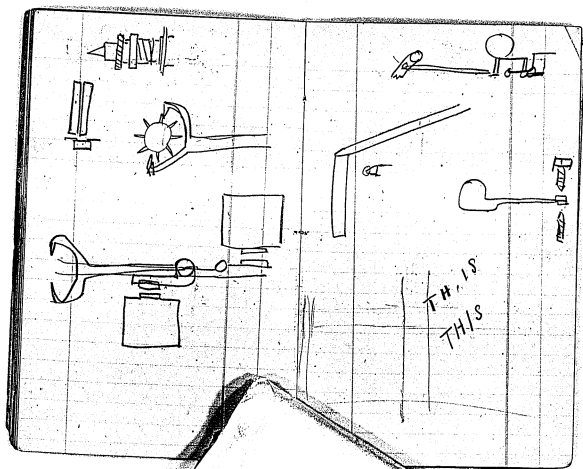
$$\begin{array}{r} 21 \\ 124 \overline{) 15000} \\ \underline{128} \\ 220 \\ \underline{208} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

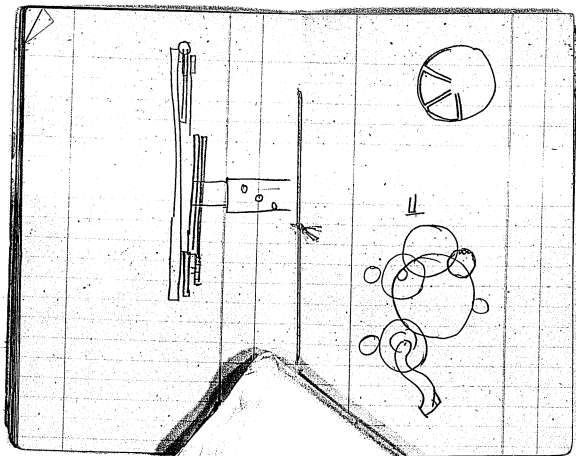
$$\begin{array}{r} 600 \\ 124 \overline{) 14400} \\ \underline{128} \\ 620 \\ \underline{620} \\ 0 \end{array}$$

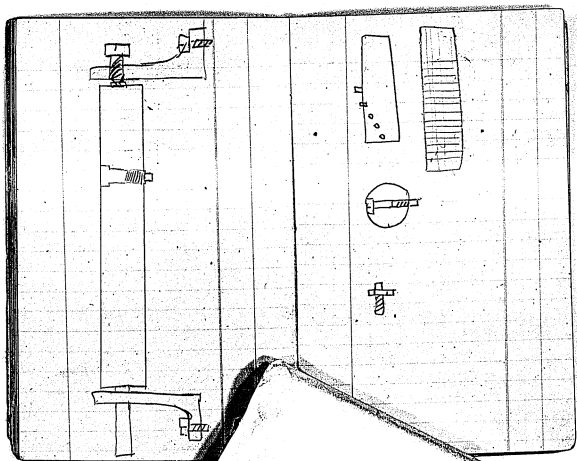
$$\begin{array}{r} 25 \\ 125 \overline{) 3125} \\ \underline{25} \\ 625 \\ \underline{625} \\ 0 \end{array}$$

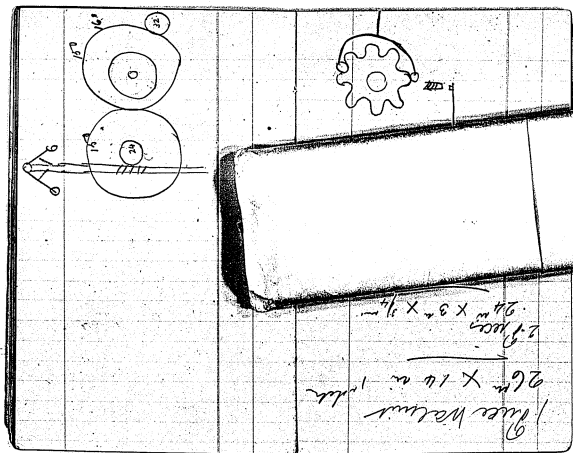


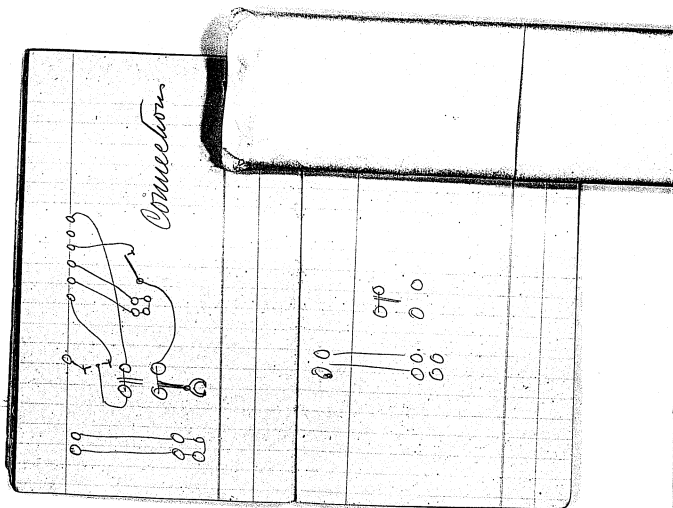
$$\begin{array}{r} 187 \\ 125 \overline{) 23375} \\ \underline{250} \\ 337 \\ \underline{325} \\ 125 \\ \underline{125} \\ 0 \end{array}$$



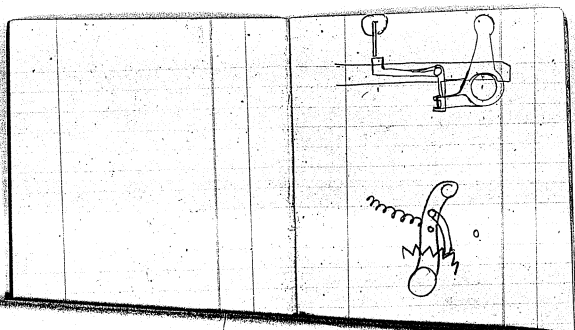


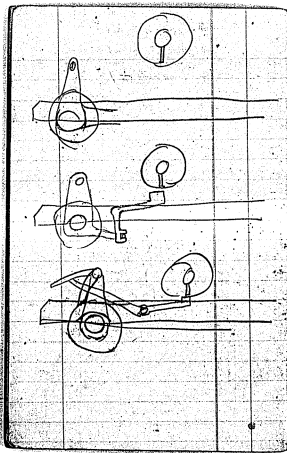






The image shows an open notebook with two blank, lined pages. The pages are cream-colored with horizontal ruling. The notebook has a dark cover visible around the edges. The binding is visible in the center crease. The pages are slightly aged and show some minor blemishes. The handwriting 'E. Osborne' is visible in the top right corner of the right page.





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NEWARK, NEAR M. & E. R. R. DEPOT.
HOUSE FURNISHING
Furniture for China, Glass,
Parlor, Hall, Stone China,
Dining Room, Paris Granite,
Chamber and Plated Ware,
Kitchen. Cutlery,
Lamps and Britannia, Tin, and
Chandeliers. Kitchen Hardware.
Large Assortment at lowest CASH PRICES (delivered free.)
SEND FOR CATALOGUE.

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83 MARKET STREET, NEWARK.
Bet. Pine & Washington Sts.



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Military Park
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STEINWAY'S, GABLER'S, and other first-class makers' Pianos, Parlor Organs and Melodeons at less than factory-prices for cash, or on SMALL MONTHLY PAYMENTS; New and second-hand Instruments to let and rent applied if purchased. Pianos &c. tuned and repaired.

DELAWARE & HUDSON CANAL CO.
OFFER THEIR
Superior Coal.

For Generating Steam,
AND FOR ALL DOMESTIC PURPOSES
AT WHOLESALE AND RETAIL.

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At Newark & Paterson Depot, & 145 Market St.
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We sell Coal at as LOW if not LOWER PRICES than any

JAS. MARSHALL & Co.

THE PEOPLES' CLOTHIERS.

809 & 811 BROAD ST

Opposite Newark Savings Bank. **NEWARK, N. J.**

Pocket Notebook, PN-75-00-00

This undated notebook by Edison and Charles Batchelor contains lists of chemicals and other materials. The cover is marked "Wanted" and the inscription "C. Edison in a/c with Edison & Murray" has been crossed out. Four pages of this unnumbered book have been used.

Wanted

C. E. ~~Edison~~

~~in ~~the~~ ~~field~~~~

Conspiring

PN-(75-00-00)

E-2554

Brax Glass
Charcoal
Powdered charcoal
Gasoline
Kerosene
Paraffin oil
Sard oil
Sperm oil
Coke
Coal
J Field spar
Clay
J Gullano
J Superphosphate of lime
Coffin paper
Cane ore
J Carbon disulphide
Dextrine
J Gum Tragacanth
J Gum Copal
Caoutchouc
Copal Varnish
Dammar Varnish

Litmus solution make
 Chalk ✓
~~Sulphuric acid~~
 Gallstone ✓
 Linseed oil
 Cottonseed oil
 Starch
 Cane sugar, brown & white
 Frosted Glass
 Whiting
 Gelatin
 Egg Albumen
 Blood "
 Salts of Soda of Potassium
 Molasses
 Syrup
 Castile soap
 Rabbit soap
 Soft soap
 Japan Varnish
 Lead paint
 Dirty

Mustard
 J Acetate
 J Isuia cumi
 Flax seed
 Pound Cotton
 Pitch
 Dry white Lead
 Putty
 Wool
 Silk floss
 Box blacking
 Stone patish
 Bar Lead
 V Cod liver Oil
 1 book gold leaf
 1 " Silver
 1 lb dried beads
 1 " Beans
 Cayenne pepper
 Clove seed
 V Gamboge
 V Cinnamon
~~Acacia~~

Coffee
 Tea
 X Rhoglene
 V Sandalwood Gum
 20g Potassium Iodide
 Partake of Antimony
 V Oxalate of Iron
 X Sulfate of Zinc
 X Fuming Nitro Acid
 X Alcohol
 Granulated Caffeine (make)
 V 2g Benzoic acid slp
 Nut galls
 Galls
 1 lb Gatta percha (Buckeye)
 Linoleum
 Stearine

Pocket Notebook, PN-75-01-01

This undated notebook contains a list of chemicals arranged alphabetically. The cover is marked "List of Chemicals." Nineteen pages of this unnumbered book have been used.

List of Chemicals
In Account With

THE SINGER IMPROVED
FAMILY SEWING MACHINE

Can be paid for in small Monthly Installments.

181,260 Sold during the year 1871.

NO CANVASSERS EMPLOYED IN THIS CITY.

LEAVE YOUR ORDER AT THE OFFICE

No. 766 Broad St. Newark, N. J.

O. T. Hopper & Co. Genl Ag'ts.

INMAN LINE
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A

Acid.	Acetic.	B.
"	Assenic.	m.
"	Assenious.	l. f.
"	Anemonie.	f.
"	Antimonie.	m.
"	Bergie.	m.
"	Boracic.	l.
"	Boric.	m.
"	Camphoric.	m.
"	Carbatic.	l. m.
"	Carbolic.	m.
"	Chemic.	"
"	Chloric.	l.
"	Chromic.	K.
"	Citric.	l. m.
"	Cyanuric.	m.
"	Filicic.	l.
"	Formic.	"
"	Gallie.	K.
"	Hippuric.	l.

A				A			
Acid.	Hydrobromic.	m.		Acid.	Salicylicum.	m.	
"	Hydrochloric	L. & F.		"	Stearic	G, M, m.	
"	Hydrocyanic.	L.		"	Stearic (Se ₂)	B.	
"	Hydrofluoric	L.		"	Sulpho-Methylic	L.	
"	Hydroiodic	L.		"	Sulpho-Tenic	m.	
"	Hydro-sulphuric	"		"	Stearic	m.	
"	Hypochloric	"		"	Sulphuric	F.	
"	Iodic	"		"	Tartaric	B.	
"	Lactic	"					
"	Malic	"					
"	Molybdemic	"					
"	Nitric	L.					
"	Nitro-Muriatic	B.					
"	Oleumic	L.					
"	Oxalic	m.					
"	Phosphoric (glacial)	C.					
"	Phosphoric	L.					
"	Phospho-Molybdic	L.					
"	Pyro-nitramic	"					
"	Pyro-nitricous	B.					

A

Aldehyde	n.
Antimony Chloral	
Acetone	n. H.
Alcohol	l.
Aldehyde	n.
Alkanet Root	a.
Aluminium Chloride	H.
Alumina	n.
Amalgam [Hg. + Sn]	f.
Ammonium Arseniate	l.
Ammon. Carbonate	l. H.
Ammon. Citrate of Iron	l.
Ammon. Chloride	f.
Ammon. Copper Sulphate	f.
Ammon. Iodide	n.
Ammon. Molybdate	f.
Ammon. Nitrate	l.
Ammon. Oxalate	"
Ammon. Phosphate	l.
Ammon. Urate	f.

A

Ammonia Water	l. & f.
Anacardite	a.
Aniline	n.
Antimony Chloral	n.
Antimony Sulphide	l. H.

B.			C.		
Barium Carbonate	G		Cadmium Carbonate	G	
B ^r Chloride	D. H.		Calcium Chloride	7. C. & D.	
B ^r Nitrate	H.		Calcium Nitrate	G	
B ^r Sulphide	L		" Sulphate	"	
Baryta	F		" Sulphide	H. & C.	
Bees' Wax	D.		Cannwood	G.	
Bismuth Carbonate	G.		Carbon Bisulphide	F	
" Oxide	"		Charls.	C & H.	
Blue Flag	A.		Cobalt (common)	J.	
Bone Black	L.		B ^r Chloride	H.	
Brass filings	C & H.		B ^r Nitrate	"	
Brazil Wood	A.		Cochineal	"	
B.amine	H.		Codene	"	
Buck Eye	A.		Copper Arsenite	L.	
Burnt Umber	J.		" Carbonate	"	
			" Ferrocyanide	"	
			" Nitrate	"	
			" Sulphate	"	
			Cotton (Soluble)	H.	

C.		F.	
Crowote.	m.	Flour.	f.
Cream of Tartar.	k.	Fusible Metal.	n.
Cudbear.	a.	Fustia.	a. 1B.
D.		G.	
Deerskin.	B.	Gamboge.	n.
Dogwood.	a.	Gold Chloride.	k.
Dragon Blood.	"	Gum Arabia.	"
E.		" Camphor.	"
Ether.	D.	" Mastic.	"
		" Sandarach.	"
		" Senggal.	"
		Syrupum.	m.
		Gum Myrrh.	B.
		" Kino.	"
		Syrupum.	D.

H.

Indigo.	L.
Do Sulphate.	M. J.
Indk [Patent].	J.
Iodine.	L.
Iron by Hydrogen.	J.
" Ferrocyanide.	.
" Oxalate.	L.
" Perchloride.	J.
" Peroxide.	.
" Pyrites.	L.
" Sulphate.	B.
" Sulphide.	C.

J

K.

Lead.	L.
" (Red).	C.
" Acetate.	J.
" Chloride.	K.
" Chromate.	M.
" Iodide.	N.
" Nitrate.	J. H.
lime Chloride.	B.
distannus.	L.
Logwood in H ₂ O.	C.

M.		N.	
Madder.	a.	Naphthaline.	i.
Magenta.	g.	Nitric.	n.
Magnesia.	m.	" Nitrate.	"
Magnesium Chloride.	g.	" Sulphate.	"
" Nitrate.	H.	Nitro Benzole.	"
" Phosphate.	i.		
" Sulphate.	"		
Manganese Acetate.	m.	O.	
" Carbonate.	H.	Oil (olive).	d.
" Peroxide.	ork	" (Castor).	f.
Malloss.	a.		
Manganese Sulphate.	K.	P.	
Mercury.	7 1/2	Pachwood.	a.
" Iodide.	n.	Phosphorus.	m.
" Perchloride.	f.	Platinum (spongy).	g.
" Potichloride.	J.	Potassium (metal).	n.
" Potassium Nitrate.	H.	" Acetate.	J.
" Sulphate.	H K	" Bichromate.	m.
" Sulphocyanide.	g. M.	" Chromate.	J.
		" Bisulphate.	7 1/2

P.		
Potassium Bitartrate	m.	
" Bromide	g. 1m.	
" Chlorate	g. 15.	
" Chloride	l.	
" Chromate	7. 1H.	
" Citrate	H.	
" Cyanide	l.	
" Ferricyanide	n. m. 10.	
" Ferri cyanide	m.	
" Hydrate	C. 1m.	
" Hyposulphite	m.	
" Iodide	m.	
" Nitrate	C. 15.	
" Nitrite	l.	
" Oxalate	l.	
" Phosphate	.	
" Permanganate	m.	
" Sulphate	C. 1m.	
" Sulphide	6. 1H.	
" Sulphocyanide	m.	

P.		
Potassium Selenate	n.	
" Telluride	m.	
" Antimoniate	l.	
Purified Powdered	l.	

Q.		
Quinine Sulphate	n.	

R.		
Resin (powder)	n.	
Rochelle Salt	g.	

S.	
Saffron.	A.
Schönbein's Sew (Zinc)	L.
Silic. Nitrate.	L.
" Ore from Utah.	"
Sodium.	N.
" Acetate.	H. L.
" Bisulphate.	S.
" Bisulphite.	"
" Carbonate.	C.
" Citrate.	S.
" Chlorate.	H.
" Hydrate.	G.
" Hyposulphite.	D.
" Molybdate.	G.
" Nitrate.	H. L.
" Nitroprusside.	N.
" Oxalate.	S.
" Phosphate.	G. S. L.
" Stannate.	S.
" Sulphate.	D. L.

S.	
Sodium Sulphite.	C. L.
" Nitrate.	C. M.
" Sulphide.	F.
" Tartrate.	H.
" Tungstate.	S.
Selenium.	N.
Spelter.	J.
Spiraeonacette.	"
Starch.	K.
Strontium Carbonate.	G.
" Chloride.	H.
" Nitrate.	H. L.
" Oxalate.	G.
" Oxide.	"
" Sulphate.	"
Stychnine.	N.
Sugar (cane).	K.
Sumac.	A.

T					
Ammonia	C.			VII	
Santonin	J.			Natural	A.
Tellurium	G.				
" Foliated	"				
" Ore	B.				
Zinc (granulated)	D.			X	P
" Perchloride	H.				
" Potchloride	H.T.			Y	
Zurmonc	A.H.				
				Z	
				Zinc (granulated)	D.
U				" Acetate	H.
				Carbonate	H.T.
				" Nitrate	H.
				" Sulphate	H.T.
V				" White	H.

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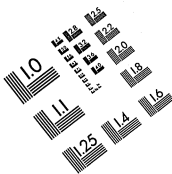
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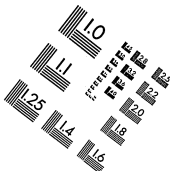
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